Appendix G

Draft Biological Assessment

BIOLOGICAL ASSESSMENT

NORTHEAST (NE)-07 PROJECT

Millennium Pipeline Project – Phase I
Millennium Pipeline Company, L.L.C.
Docket No. CP98-150-006, et al.
Columbia Gas Transmission Corporation
Docket No. CP98-151-000, et al.

Line A-5 Replacement Project
Columbia Gas Transmission Corporation
Docket No. CP05-19-000

Empire State Pipeline and Empire Pipeline, Inc.
Docket No. CP06-5-000, et al.

Ramapo Expansion Project
Algonquin Gas Transmission System, LLC
Docket No. CP06-76-000

MarketAccess Project
Iroquois Gas Transmission System, LP
Docket No. CP02-31-000

Empire Connector Project

Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street, NE
Washington, DC 20426

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NE-07 PROJECT
Biological Assessment

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ACRONYMS AND ABBREVIATIONS

Algonquin	Algonquin Gas Transmission System, LLC
BA	Biological Assessment
Certificate	Certificate of Public Convenience and Necessity
Con Edison	Consolidated Edison Company
COE	U.S. Army Corps of Engineers
Columbia	Columbia Gas Transmission Corporation
Commission	Federal Energy Regulatory Commission
CS	compressor station
CTDEP	Connecticut Department of Environmental Protection
CWA	construction work area
DOT	U.S. Department of Transportation
Dth/d	decatherms per day
ECS	Environmental Construction Standards
Empire	Empire State Pipeline and Empire Pipeline, Inc.
ESA	Endangered Species Act
FEIS	final environmental impact statement
FERC	Federal Energy Regulatory Commission
FWS	U.S. Fish and Wildlife Service
HDD	horizontal directional drill
hp	horsepower
Iroquois	Iroquois Gas Transmission System, LP
M&R	measuring and regulating
Millennium	Millennium Pipeline Company, L.L.C.
MP	milepost
NE-07	Northeast 07 Project
NMFS	National Marine Fisheries Service
NYNHP	New York Natural Heritage Program
NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
Plan	Upland Erosion Control, Revegetation, and Maintenance Plan
Procedures	Wetland and Waterbody Construction and Mitigation Procedures
ROW	right-of-way
TNC	The Nature Conservancy
U.S.	United States
WMA	Wildlife Management Area

1.0 INTRODUCTION

On September 19, 2002, the Federal Energy Regulatory Commission (FERC or Commission) issued an order approving the Millennium Pipeline Project proposed by Millennium Pipeline Company, L.L.C. (Millennium) in Docket Nos. CP98-150 et al and the related abandonment application proposed by Columbia Gas Transmission Corporation (Columbia) in Docket Nos. CP98-151 et al. The Northeast (NE)-07 Project would in effect be a modification of and an alternative to the Millennium Pipeline Project approved in that proceeding. It would include construction and operation of certain facilities approved for the Millennium Pipeline Project, with some additions and modifications, as well as facilities proposed by Empire State Pipeline and Empire Pipeline, Inc. (collectively referred to as Empire), Algonquin Gas Transmission System, LLC (Algonquin), and Iroquois Gas Transmission System, LP (Iroquois) as summarized in section 2.1.

Section 7 of the Endangered Species Act of 1973 (ESA), as amended, requires federal agencies to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally-listed endangered or threatened species, or result in the destruction or adverse modification of the designated critical habitat of a federally-listed or proposed species. Under section 7, the Commission is required to consult with the United States (U.S.) Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS) to determine whether any federally listed or proposed endangered or threatened species, or their designated critical habitats occur in the vicinity of a proposed project that is subject to FERC jurisdiction.

In the event that a federally listed or proposed endangered or threatened species or its designated critical habitat occurs in the vicinity of a "major construction activity," the FERC must prepare a biological assessment (BA) to determine whether the proposed action would affect that species. If the BA determines that the proposed action would affect a federally listed or proposed species, then the FERC must enter into formal consultation and obtain a Biological Opinion from the FWS or NMFS before taking final agency action.

To fulfill its responsibilities under section 7 of the ESA, the FERC, through informal consultation with the FWS and NMFS and state agencies, has determined that six federally listed or proposed species may occur in the vicinity of the proposed NE-07 Project. The species are listed in Table 1-1. One species (the federally endangered bald eagle) was proposed for delisting on July 4, 1999, but has not been delisted yet. Because it has been documented along the proposed route and is a state-listed species, it is included in this BA.

This BA examines the potential impact of construction and operation of the NE-07 Project on the six federally listed species. Detailed information concerning the location of the federally listed species was obtained based on consultation with federal and state natural resource management agencies, and field surveys performed by the applicants (see appendix A for informal communications). In addition, a supplemental draft BA for the Indiana bat, and a supplemental draft BA for the Millennium Pipeline Project – Phase I was prepared by Millennium and filed with the FERC.

TABLE 1-1
Federally-Listed Species That Potentially Occur in the Vicinity of the NE-07 Project

Common Name	Scientific Name	Status a/	Locations Where Species May Occur b/
Shortnose sturgeon	*Acipenser brevirostrum*	F-E, NY-E, NJ-E, CT-E	A – Hudson River Valve Site
Dwarf wedge mussel	*Alismodonta heterodon*	F-E, NY-E	M – Neversink River, Orange County
Indiana bat	*Myotis sodalis*	F-E, NY-E, NJ-E, CT-E	M – Orange and Rockland Counties E – Ontario, Yates, Schuyler, Chemung, and Steuben Counties A – Stony Point, Southeast, Hanover Compressor Stations; Pipeline Replacement I – Dover Compressor Station
Bald eagle	*Haliaeetus leucocephalus*	F-T, NY-T, NJ-E, CT-E	M – Delaware, Sullivan, and Orange Counties A – Hanover Compressor Station, Hudson River Valve Site
Bog turtle	*Clemmys muhlenbergii*	F-T, NY-E, NJ-E, CT-E	M – Orange County A – Pipeline Replacement, Stony Point, Southeast, and Oxford Compressor Stations I – Dover Compressor Station
Leedy's Roseroot	*Sedum integrifolium* spp. *leedyi*	F-T, NY-E	E – Schuyler county

a/ F = Federal Endangered (E) or Threatened (T) Species, NY = New York E or T Species, CT = Connecticut E or T Species, NJ = New Jersey E or T Species

b/ M = Millennium Pipeline Phase I Facilities, E = Empire Connector Facilities, A = Algonquin Ramapo Expansion Facilities, I = Iroquois MarketAccess Facilities

2.1 PURPOSE

Millennium Pipeline Project – Phase I

Millennium does not presently own any pipeline facilities but would construct and operate pipeline and other facilities and acquire pipeline and other facilities from Columbia for continued use and/or replacement. Millennium has redesigned and reduced the scale of the system that the Commission previously authorized to meet the current needs of the natural gas market. The Phase I Project would provide for the delivery of about 525,400 decatherms per day (Dth/d) to Millennium's customers (as opposed to 714,000 Dth/d in the original Certificate of public convenience and necessity [Certificate] application). It would interconnect with Algonquin's 26- and 30-inch-diameter pipelines at the existing Ramapo Measuring and Regulating (M&R) Station.

Columbia Line A-5 Replacement Project

In February 2003, Columbia committed to the U.S. Department of Transportation (DOT) and New York Public Service Commission to implement an Age and Condition Program, an ongoing system upgrade program to replace sections of the aging A-5 pipeline to ensure safety and continuity of service. Initially, Columbia intended replacing the multi-diameter Line A-5 with 10-inch-diameter pipeline, and some segments of Line A-5 were replaced in 2003 and 2004 in compliance with the DOT direction. Similarly, in 2005, Columbia had planned to replace the easternmost 8.8 miles of Line A-5 with 10-inch-diameter pipeline. However, Columbia re-evaluated its plan and determined that replacement with 30-inch-diameter pipeline (instead of 10-inch-diameter pipeline) would be a better choice, due to the anticipated demand for increased throughput in its system in this area.

Columbia stated that replacement with the larger, 30-inch-diameter pipeline would avoid repeated disturbance of sensitive areas in the event that, in the near future, Columbia needed to increase capacity and construct the proposed larger diameter pipeline to accommodate potential future system expansion and meet anticipated market growth. Specifically, this would avoid repeated impacts to resources in Sterling Forest® State Park, the Ramapo River, Kakiat Park, and Harriman State Park.

Columbia stated that the Line A-5 Pipeline Replacement was needed to continue and ensure long-term reliability of firm service to Columbia's existing customers, and also represents a necessary link in Millennium's proposed transmission system between the Phase I Project and the identified downstream pipeline projects and markets/customers.

Empire Connector Project

The Empire Connector Project would provide natural gas transportation capacity for gas supplies delivered to Empire State Pipeline at the interconnection of the facilities of TransCanada Pipelines Ltd. and Empire State Pipeline at the U.S. – Canada border.

The Empire State Pipeline would transport gas to the proposed Empire Connector Project in Victor, New York. Gas would then be transported via the Empire Connector Project to the proposed Millennium Phase I Project at Corning, New York. The Empire Connector Project would add about 250,000 Dth/d of transmission capacity for shippers on its system. It would deliver gas to Millennium's pipeline for shippers in downstream markets in the New York City, New Jersey, and New England areas.

Algonquin Ramapo Expansion Project

The purpose of the Ramapo Expansion Project is to provide additional capacity to facilitate transportation of new supply receipts from Millennium's Phase I Project, and specifically, to provide 125,000 Dth/d of natural gas transportation capacity to Consolidated Edison Corporation (Con Edison) and 200,000 Dth/d of transportation capacity to KeySpan. Millennium's Phase I Project and the Ramapo Expansion Project would provide transportation service to customers in the New York natural gas market specifically, and the New England market generally, with additional access to natural gas supplies from traditional production sources attached to the natural gas pipeline grid in the U.S. and Canada, as well as access to local production and storage in New York.

Iroquois MarketAccess Project

The purpose of the Iroquois MarketAccess Project is to provide firm natural gas transportation services to Con Edison. Of this volume, 100,000 Dth/d would be delivered by Algonquin to Iroquois at Brookfield, Connecticut, for Con Edison's account, beginning November 1, 2007. The gas would then be transported by Iroquois and delivered to Con Edison at its existing Hunts Point, New York meter station.

In order to increase system capacity to receive the natural gas from Algonquin and provide the transportation services, Iroquois would also construct gas cooling facilities at its Dover, New York compressor station (CS) and install a transfer compressor and gas cooling facilities at its interconnect with Algonquin at Brookfield, Connecticut. The transfer compressor would increase the pressure of the gas being delivered by Algonquin in order to allow it to enter Iroquois' system.

Ultimately, the Commission will determine the need for the NE-07 Project and whether it should issue the applicants a Certificate under section 7(c) of the Natural Gas Act. The Commission will take into account all aspects of the proposal including the customers, cost, financing, rates, engineering, economic risk, and environmental impact when weighing these factors to make that decision.

PROPOSED FACILITIES

Millennium Pipeline Project – Phase I

Millennium would construct and operate certain amendment facilities in Docket No. CP98-150-006 and CP98-150-007 for the Millennium Pipeline Project – Phase I (Phase I Project). The Phase I Project includes:

- construction of about 181.7 miles of 30-inch-diameter pipeline from Corning, New York, to Ramapo, New York, (from milepost [MP] 190.6 to

MP 376.6), with four proposed route modifications within this area;

- acquisition from Columbia and continued use of about 7.1 miles of 24-inch-diameter Line A-5 pipeline from MP 340.5 to MP 347.7;
- construction of 1,278 feet of 24-inch-diameter pipeline from MP 343.8 to MP 344.1;
- installation of additional compression and M&R facilities at Columbia's existing Corning CS (MP 190.6);
- construction of the Wagoner M&R station in Milford, Pike County, Pennsylvania;
- installation of upgrades to the Ramapo M&R station in Ramapo, Rockland County, New York;
- three route variations/realignments totaling about 19 miles along the existing NYSEG powerline ROW:
  a) Chemung Variation (MP 198.0 – 203.6)
  b) Tioga–Broome Variation (MP 232.2 – 245.0)
  c) Delaware Variation (MP 284.4 – 284.9); and
- a 5,600-ft (1.1-mile) route variation/change around Warwick Isle subdivision (MP 350.8 – 351.6).

In addition, the Phase I Project would include construction and operation of Columbia's proposed Line A-5 Replacement Project (Docket No. CP05-19-000). (On August 1, 2005, Columbia requested that this application be consolidated with Millennium's amended application.) The Line A-5 Replacement Project consists of:

- replacement of 8.8 miles of 8- and 16-inch-diameter segments of Columbia's existing Line A-5 pipeline with larger 30-inch-diameter pipeline in Orange and Rockland Counties, New York;
- modification of three existing M&R stations (the Tuxedo, Sloatsburg, and Ramapo M&R stations) on this segment of Line A-5 to accommodate the larger diameter pipeline;
- abandonment in place of about 1.0 mile of the existing Line A-5 pipeline;
- the Sterling Forest – Laurel Ridge Route Variation (MP 367.8 – 368.5); and
- the Ramapo River HDD Variation (MP 369.5 – 370.3).

Empire Connector Project

Empire proposes in Docket No. CP06-5-000 to construct the Empire Connector Project. This project would consist of:

- construction of about 78 miles of new 24-inch-diameter pipeline and associated facilities in Ontario, Yates, Schuyler, Chemung, and Steuben Counties, New York; and
- construction of a new CS in Genesee County, New York.

Algonquin Ramapo Expansion Project

Algonquin proposes in Docket No. CP06-76-000 to construct the Ramapo Expansion Project. This project consists of:

- replacement about 4.9 miles of existing 26-inch-diameter pipeline

with 42-inch-diameter pipeline in Rockland County, New York;
- construction of miscellaneous pipeline modifications and meter station modifications at several locations in Rockland County, New York, and Fairfield County, Connecticut;
- modifications to three existing CS's in Rockland and Putnam Counties, New York, and Morris County, New Jersey; and
- construction of one new natural gas CS in New Haven County, Connecticut.

Iroquois MarketAccess Project

Iroquois proposes in Docket No. CP02-31-002 to amend the Certificate it received from the Commission on October 31, 2002, in Docket No. CP02-31-000 to modify the approved facilities and to construct and operate certain additional facilities for the MarketAccess Project. An environmental assessment was issued for Iroquois' Brookfield Expansion Project in the original proceeding. This project would consist of:

- reduction of the proposed size of the compressor to be constructed in the Town of Brookfield, Connecticut, from 10,000 horsepower (hp) to 7,700 hp;
- construction of a new transfer CS and natural gas cooling facilities in the Town of Brookfield, Fairfield County, Connecticut; and
- installation of cooling facilities at Iroquois' existing CS in Town of Dover, Dutchess County, New York.

The FERC has identified six federally listed endangered or threatened species that could potentially occur in the vicinity of the NE-07 Project facilities. During the certification process for the original Millennium Pipeline Project, the FWS identified an additional three federally listed endangered or threatened species not included here: northern wild monkshood, the northern rifflesheII, and the clubshell. These species are not reported to occur along the Millennium Phase I Project area, and therefore are not discussed in this BA. A more detailed discussion of these species as they pertain to the previously certificated Millennium Pipeline Project may be found in the Millennium Pipeline Project FEIS, FERC/EIS-0123F Vol. 1 (2001). Table 3-1 provides the FERC's determination of the project's effect on the six federally listed endangered or threatened species that potentially occur in the

TABLE 3-1
Potential Effect of the NE-07 Project on Federally-Listed Endangered or Threatened Species

Common/Scientific Name	Status a/	Locations Where Species May Occur b/	Project Effect
Shortnose sturgeon *Acipenser brevirostrum*	F-E, NY-E, NJ-E, CT-E	A – Hudson River Valve Site	A – Not Likely to Adversely Affect
Dwarf wedge mussel *Alismodonta heterodon*	F-E, NY-E	M – Neversink River, Orange County	M – Not Likely to Adversely Affect
Indiana bat Myotis sodalis	F-E, NY-E, NJ-E, CT-E	M – Orange and Rockland Counties E – Ontario, Yates, Schuyler, Chemung, and Steuben Counties Ac/ – Stony Point, Southeast, Hanover CSs, Pipeline Replacement I – Dover Compressor Station	M – May Affect, But Not Likely to Adversely Affect E, I – Not Likely to Adversely Affect A – Determination Not Yet Made
Bald eagle *Haliaeetus leucocephalus*	F-T, NY-T, NJ-E, CT-E	M – Delaware, Sullivan, and Orange Counties A – Hanover Compressor Station, Hudson River Valve Site	M, A – Not Likely to Adversely Affect
Bog turtle *Clemmys muhlenbergii*	F-T, NY-E, NJ-E, CT-E	M – Orange County A – Pipeline Replacement, Stony Point, Southeast, and Oxford Compressor Stations I – Dover Compressor Station	M, A, I – Not Likely to Adversely Affect
Leedy's roseroot *Sedum integrifolium* ssp. *Leedyi*	F-T, NY-E	E – Schuyler county	E – Not Likely to Adversely Affect

a/ F = Federal Endangered (E) or Threatened (T) Species, NY = New York E or T Species, CT = Connecticut E or T Species, NJ = New Jersey E or T Species
b/ M = Millennium Pipeline Phase I Facilities, E = Empire Connector Facilities, A = Algonquin Ramapo Expansion Facilities, I = Iroquois MarketAccess Facilities
c/ Surveys required to determine if species is present.

vicinity of the NE-07 Project.

Millennium, Columbia, Algonquin, and Iroquois all propose to implement the construction, restoration, and maintenance procedures identified in their environmental construction standards (ECS), which incorporate the FERC's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures) (see Appendix B). Our [1/] Plan and Procedures were developed in response to concerns raised by federal, state, and local agencies regarding the potential impact of construction of natural gas pipeline projects in general. The Plan was developed to provide methods to minimize erosion and sedimentation; the Procedures were developed to provide a minimum level of protection for surface waters and wetlands that would be affected by proposed projects. These waters include any stream or river with perceptible flow at the time of crossing and other permanent waterbodies, such as ponds, lakes, and reservoirs. Implementation of each pipeline company's ECS, and our Plan and Procedures would minimize project impacts on several federally listed endangered or threatened species that possibly occur in the vicinity of the proposed NE-07 Project.

3.1 Shortnose Sturgeon

Background

The shortnose sturgeon was listed as a federally endangered species on March 11, 1967. It is a diadromous species that occurs only along the east coast of North America in tributary rivers to the Atlantic Ocean and is known to occur in the Hudson River between the George Washington Bridge in Manhattan and the Federal Lock and Dam in Troy, New York. The Hudson River provides spawning, seasonal foraging, and overwintering habitat for this species, and Haverstraw Bay (the location of the original Millennium Pipeline Project proposed crossing) provides seasonal foraging and overwintering habitat (NMFS 1997). Habitat alteration, associated with pollution and dam construction in rivers flowing to the Atlantic Ocean, is the primary reason for the endangered status of this species. Other threats include incidental taking by commercial fishermen, and channel dredging and disposal of materials. The shortnose sturgeon is also a state-listed endangered species in New York.

The shortnose sturgeon is a migratory fish with a complex life history. It is a benthic predator that feeds on macroinvertebrates during the summer months and prefers the oligohaline region of rivers, which contains the biologically productive saltwater/freshwater interface (Haley, et al. 1996). The shortnose sturgeon inhabits estuaries and large coastal rivers, and moves upstream and downstream with the seasons. There have been inconsistent descriptions of shortnose sturgeon migratory behavior due to the varying habitat distributions used during the species' four life stages. The four life stages of the shortnose sturgeon are larval, juvenile, non-spawning adult, and spawning adult.

Research from other rivers indicates that an individual adult may spawn once every three years, indicating that for any given year, the majority of the adults in the river are not spawning (Bain et al. 1995). From late fall until early April, the pre-spawning adults have been well documented to overwinter in a torpid state in the deep channel habitats of the Hudson River near Sturgeon Point (about river mile 86) and Kingston, New York (river mile 94) (Bain 1997). In mid-April the spawning fish move upstream to the spawning grounds between Coxsackie, New York (river mile 120) and the Troy Dam at Troy, New York (river mile 153). Spawning occurs from mid-April to late May. Afterwards, the adults disperse downriver into the summer range between river miles 24 and 76. From late spring until early fall, the adult fish are distributed in this summer range for feeding in the deep channel habitats of the freshwater and brackish parts of the estuary.

Spawning reportedly occurs primarily over gravel or cobble in areas of relatively fast water. Fertilized eggs adhere to the substrate. Hatching generally occurs within 7 to 10 days depending on water

1/ "We", "us", and "our" refer to the environmental staff of the Office of Energy Projects, part of the Commission staff.

temperature. Larvae generally seek cover within the substrate. About 10 days following hatching, the larvae have developed mouths, eyes, and precursors to adult fins. During this time period, the larvae have begun to disperse downstream in the Hudson River. They occur primarily in fast, deep waters and have been associated with the spawning areas between Hudson River miles 120 and 153.

Less research has been performed for the juveniles and non-spawning adults of the shortnose sturgeon, and consequently, this portion of the population has been underestimated in past studies. The juvenile shortnose sturgeon prefer to remain above the saltwater/freshwater interface, but by late fall and early winter, most older juveniles occupy the same broad region of the Hudson River near Haverstraw Bay that the non-spawning adults inhabit (NMFS 1998b).

The non-spawning adults summer in the same range as the spawning adults. As water temperature drops in late fall, the fish move to one of two wintering areas. Dovel et al. (1992) concluded that most adults overwinter near Kingston; however, subsequent river monitoring in late fall indicates that the non-spawning adults overwinter in the seasonally brackish waters near Haverstraw Bay (river miles 34 to 39) (Bain 1997). In the spring, these fish migrate upstream and remain in the tidal portion of the river, primarily downstream of Kingston. The population of shortnose sturgeon likely to inhabit portions of Haverstraw Bay during the winter would be non-spawning adults and older juveniles.

Project Components In the Vicinity of the Shortnose Sturgeon

Algonquin Ramapo Expansion

Field Survey Methodology and Results

No field surveys for the shortnose sturgeon have been performed by Algonquin. However, monitoring data collected for electric utilities suggest that populations have been increasing in the Hudson River. To verify these findings, several studies have been conducted (Dovel et al. 1992 and Bain et al. 1995). These studies indicate that Hudson River populations of the shortnose sturgeon may have increased by more than 400 percent from the 1970s to the present (Dovel estimated 13,000 fish in the 1970s and Bain estimates a present [1995] population of about 55,000).

Summary of Impacts

Within the region of the Algonquin Ramapo Expansion Project, occurrences of and habitat for the shortnose sturgeon are restricted to the Hudson River. Construction at Algonquin's Hudson River Valve Site would be located at the river crossing valves, about 150 feet from the river, and would not involve any in-water activities in the Hudson River. In addition, none of the other Algonquin project components would result in any temporary or permanent disturbances to the Hudson River.

Determination of Effect

The FERC staff have concluded that construction and operation of the Algonquin Ramapo Expansion portion of the NE-07 Project would not affect the shortnose sturgeon or any suitable habitat of the species, because no in-water activities would occur in the Hudson River.

Overall Determination of Effect For the Shortnose Sturgeon

The FERC staff have concluded that construction and operation of the NE-07 Project would not likely adversely affect the shortnose sturgeon or any suitable habitat of the species, because no portion of the NE-07 Project construction, operation, or maintenance would occur in the Hudson River.

3.2 Dwarf Wedge Mussel

Background

The dwarf wedge mussel is a small freshwater mussel inhabiting large streams and rivers that drain into the Atlantic Ocean, and is known to occur in at least 20 streams and rivers along the Atlantic coast from New Hampshire to North Carolina (Strayer et al. 1996). However, the surviving populations in many of these locations are small. In New York, the dwarf wedge mussel occurs in the Neversink River in Orange County. The dwarf wedge mussel was listed as a federally endangered species on March 14, 1990. The primary threats to this mussel are associated with loss of suitable habitat from dam construction, water pollution, and sedimentation (Lowe et al. 1990). The dwarf wedge mussel is also listed as a state-endangered species in New York.

The dwarf wedge mussel inhabits large streams and rivers, and appears to prefer moderate current speeds (about 0.2 to 0.5 feet per second) and possibly locations in which current is spatially uniform (Strayer and Ralley 1993). The dwarf wedge mussel is found in association with substrate that includes patches of fine sediments, although the species is apparently relatively intolerant of silt deposition. Data indicate that the dwarf wedge mussel occurs primarily in softer waters containing lower concentrations of calcium (Strayer 1993).

The dwarf wedge mussel is sexually dimorphic; individuals are either male or female, as opposed to some mussel species in which all individuals are hermaphroditic. The age of sexual maturity for the dwarf wedge mussel is not reported in the literature. However, the dwarf wedge mussel has an unusually short life span for a mussel, with a maximum reported age for the species of about 10 years (Michaelson and Neves 1995). Thus, it is likely that the species becomes sexually mature rather early. Although there is conflicting information in the literature concerning the specifics of the reproductive cycle, it is generally believed that males release gametes into the water column and the females take up these gametes. The resulting fertilized cells are called glochidia, which are retained by the female within a marsupium while they develop. Gravid females (containing glochidia) have been reported from early June to late August (Clarke 1981) or from February to August (Johnson 1970). Regardless of the actual time period, dwarf wedge mussels appear to brood the glochidia for a long period before releasing mature glochidia to the water column.

Once released to the water column, mature glochidia must attach to a host fish to continue development. The host fish species for the dwarf wedge mussel include mottled sculpin, johnny darter, and tessellated darter (Michaelson and Neves 1995). The length of the association of the glochidia with fish has not been specifically identified, although this period typically lasts for several weeks for other mussel species. Following this period, the individual enters the velliger stage, where the mussel reenters the water column and settles to the substrate. The velliger begins to secrete a shell and develops into a juvenile mussel.

As with other mussel species, the dwarf wedge mussel feeds by filtering large quantities of water. Food particles are filtered out of the water and digested. Specific food of the dwarf wedge mussel is not reported. However, it is likely to consist of algae and small zooplankters that inhabit the water column.

Project Components In the Vicinity of the Dwarf Wedge Mussel

Millennium Phase I

Field Survey Methodology and Results

The original Millennium Pipeline Project included construction of a bored crossing of the Neversink River, a small to mid-sized river that is about 100 feet wide at the proposed pipeline crossing. The proposed crossing of the Neversink River would have been in the downstream portion of the reported extent of the

dwarf wedge mussel habitat. The species was assumed to occur at the crossing location, since it had been found upstream and downstream of the crossing. The Nature Conservancy (TNC) confirmed that the largest population of the dwarf wedge mussel in the state occurs at the proposed crossing location (TNC 1998). In 2005, Millennium conducted a survey in the Neversink River to determine whether the species was present at the crossing location. No evidence of live or dead dwarf wedge mussels was found. A detailed discussion of the survey methodology and results can be found in the February 2006 Millennium report, which was sent to the FWS and the FERC, titled *Final Report: Unionid, Tiger Beetle, and Hellbender Surveys at Seven Proposed Stream Crossings of the Millennium Pipeline in New York.*

Summary of Impacts

If the Neversink River were open cut or if an equipment bridge were installed across the river, potential impacts on the dwarf wedge mussel could include both direct (displacement or loss of individuals) and indirect impacts (disruption or loss of habitat). Other indirect impacts could also occur as a result of sedimentation from construction disturbances.

Alternatives Considered

A number of alternative crossing locations have been considered for the Neversink River during the course of the Millennium Pipeline Project and the Phase I Project. During consultation for the Phase I Project in 2004 and 2005, Millennium, the FWS, the U.S. Army Corps of Engineers (COE), New York State Department of Environmental Conservation (NYSDEC), and TNC again considered alternative crossing locations. TNC argued against alternative crossing locations on two grounds. First, periodic monitoring of the dwarf wedge mussel population in the Neversink River had indicated that the distribution of the population was expanding both upstream and downstream through time. Thus, previously considered alternative crossing locations were not likely to avoid impacts to locations supporting the existing population. Second, any alternative crossing location would require that the pipeline route follow the course of the river for some extended distance along both banks. TNC argued that this would increase the potential impact of unanticipated sedimentation or spills in the existing population of mussels in the river.

Alternative construction methods have also been evaluated for the Neversink River crossing. Millennium conducted preliminary investigations of a horizontal directional drill (HDD) of the Neversink River in 1997 and concluded that a HDD at the proposed crossing location would be infeasible, primarily because of cost and topographic considerations.

In 2004 and 2005 Millennium reassessed the use of a conventional bore technique to construct the Neversink River crossing. The result of this reassessment was that the method was likely to fail based on the subsurface conditions at the site. This led to the re-examination of other potential crossing techniques. A HDD remained infeasible due primarily to unfavorable geotechnical criteria and to the steep topography present on the eastern bank of the river. Discussions with the FWS, COE, NYSDEC, and TNC indicated that these agencies remained opposed to any construction method that would result in substrate disturbance. Millennium also examined the feasibility of constructing an aerial crossing of the Neversink River. While this method was technically feasible, this alternative was dismissed due to considerations of construction and maintenance cost, and more importantly, potential security issues.

After re-examination of all possible alternatives, Millennium proposed incorporating a segment of Columbia's existing 24-inch-diameter Line A-5 pipeline between MPs 340.5 and 347.7 into the Phase I Project to avoid making a new crossing of the Neversink River. An evaluation of the flow modeling data indicated that the incorporation of about 7.1 miles of the existing pipeline from the Huguenot M&R facility on the west side of the river (MP 340.5) to the Westtown M&R facility in central Orange County (MP 347.7) was feasible if a small section of this pipeline located in the vicinity of Interstate 84 (MP 343.8 to MP 344.1) were replaced. The continued utilization of this segment of the existing Line A-5 pipeline would result in the

avoidance of any construction in the Neversink River.

Determination of Effect

The FERC staff has determined that the proposed Phase I Project would avoid construction in the immediate vicinity of the Neversink River. Within the region of the Phase I Project, occurrences of and habitat for the dwarf wedge mussel are restricted to the Neversink River. The Phase I Project does not affect the Neversink River. Therefore, we conclude that construction and operation of the Phase I Project would not adversely affect the dwarf wedge mussel or any suitable habitat of the species.

Overall Determination of Effect For the Dwarf Wedge Mussel

The FERC staff have concluded that construction and operation of the NE-07 Project would not adversely affect the dwarf wedge mussel or any suitable habitat of the species, because no portion of the NE-07 Project construction, operation, or maintenance would occur in the Neversink River.

3.3 Indiana Bat

Background

The Indiana bat (*Myotis sodalis*) is a medium-sized bat known from the northeast region of the U.S., including southeastern New York, northern New Jersey, and several other surrounding states. The Indiana bat utilizes winter hibernacula and spring/summer roosting locations within this region. The FWS listed the Indiana bat as endangered on March 11, 1967. The most current range-wide estimate of the population is about 457,000 individuals, which represents about 52 percent of the estimated population of the 1960s. Long-term, detailed documentation of population changes are lacking across most of its range, with the exception of the state of Indiana (Brack et al. 1983 and 2003, Johnson et al. 2002). It is probable that habitat loss during summer (FWS 1999*a*) and winter disturbances during hibernation (Johnson et al. 1998) both contributed to the overall decline of the species.

A recovery plan for the species was completed on October 14, 1983. In October 1996, the Indiana Bat Recovery Team released a Technical Draft Indiana Bat Recovery Plan. In October 1997, a preliminary version entitled "Agency Draft of the Indiana Bat Recovery Plan," which incorporated changes from the 1996 Technical Draft, was released. Subsequently, an agency draft entitled "Indiana Bat (*Myotis sodalis*) Revised Recovery Plan" was distributed for comments in March 1999. A new draft revised recovery plan is being prepared. Critical habitat was designated on September 24, 1976, and includes 11 caves and 2 abandoned mines in Illinois, Indiana, Kentucky, Missouri, Tennessee, and West Virginia.

The life history of the Indiana bat is somewhat complex. The species hibernates during winter months in caves and abandoned mines. During the species' active period, individuals migrate, in some cases over fairly long distances, from the hibernacula to summer roosting areas. A brief description of the phases of the life history follows.

Large populations of Indiana bats hibernate in caves and mines in Indiana, Illinois, Kentucky, and Missouri (over 73 percent of the known population). Indiana bats sometimes hibernate in abandoned mines and other man-made underground chambers. Smaller populations of hibernating Indiana bats are known from Alabama, Arkansas, Connecticut, Georgia, Iowa, Maryland, Massachusetts, Michigan, Mississippi, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, West Virginia, and Wisconsin (FWS 1999a). Although the winter range is large, the known population of the species hibernates in only 336 hibernacula in an area with tens of thousands of caves and mines.

Autumn swarming and spring staging typically occur in woodlands near the hibernacula, with use of the hibernacula increasing as autumn progresses, and decreasing as spring progresses. A variety of telemetry studies have shown that lands within five miles of hibernacula are important to Indiana bats during spring and autumn (e.g. Brack in submission; Gumbert 2001).

Little is known about the habitat used by either sex during migration, although it is generally presumed to include a variety of wooded habitats. Indiana bats caught in spring or autumn, especially near a cave or mine, may be present for one or more of the following reasons: 1) winter hibernation (and "preparation" for hibernation), 2) autumn swarming, 3) spring staging, and 4) transient or migratory use. However, autumn and spring sampling of hibernacula routinely produce captures of Indiana bats, and the absence of such captures is routinely considered sufficient evidence to indicate the cave or mine is not a hibernaculum. Failure to catch large numbers of bats of any species is also strong evidence that the cave or mine is not suitable as a hibernaculum.

The seasons of spring and autumn migration/transient period are generally inferred as the time between when bats leave the hibernacula and when they are found in maternity areas (spring), and vice versa (autumn). In most portions of the range, this is generally considered to be April 15 to May 15 in spring, and August 15 to November 15 in autumn, although these dates are sometimes adjusted regionally to accommodate latitudinal differences in season.

There are no data indicating how many individuals are in any given area during the spring and autumn migratory/transient period, nor the duration of their stay. Data indicate that some Indiana bats may already be at the winter hibernacula while some individuals are still at summer roosts, and that "waves" of individuals arrive and depart the hibernacula.

In summer, females form maternity colonies in trees. Maternity colonies may form many miles from hibernacula, and females from a single maternity colony may come from more than one hibernaculum. In contrast, males often use wooded areas near the hibernacula, occasionally visiting it throughout the summer (Brack 1983, Whitaker and Brack 2002). However, some individual males may migrate distances similar to females.

The core summer range of the Indiana bat is southern Iowa, northern Missouri, northern Illinois, northern Indiana, southern Michigan, and western Ohio. There are reproductive records from Iowa, Missouri, Illinois, Indiana, Michigan, Kentucky, Tennessee, North Carolina, West Virginia, Pennsylvania, New Jersey, Vermont, and New York.

In order to assist the FERC in preparing a BA for the NE-07 Project and to expedite review of effects on the species, Millennium issued a draft BA for the Indiana bat for the Millennium Phase I Project in January 2006. The report, titled *Biological Assessment of the Federally-Endangered Indiana Bat (Myotis sodalis) for Phase I of the Millennium Pipeline Project, Orange and Rockland Counties, New York* (Phase I Indiana Bat BA), contains the results of surveys and studies of Indiana bats in the Phase I Project area, and readers can refer to this document for a more detailed description of Indiana bat background and natural history.

Project Components In the Vicinity of the Indiana Bat

Millennium Phase I

Field Survey Methodology and Results

Millennium has issued two separate documents presenting findings with respect to the Indiana bat. The report entitled *2005 Summer Mist Net Survey for the Federally-Endangered Indiana Bat for Phase I of the Millennium Gas Pipeline Project, Orange and Rockland Counties, New York* (Mist Net Report) reports

results of the sampling program undertaken by Millennium to determine whether Indiana bats occur in the vicinity of the Phase I Project. As mentioned above, the Phase I Indiana Bat BA serves as a draft BA for the Phase I Project effects on the Indiana bat, and presents a more detailed analysis. The following is a summary of the findings of the Phase I Indiana Bat BA.

Relatively little is known about the summer distribution of the Indiana bat in New York. For that reason, the FWS requested that sampling for the species be conducted within suitable habitat along the Phase I Project route in Orange and Rockland Counties. This sampling effort was conducted in summer and early fall of 2005. The survey methodology is reported in the Mist Net Report.

Results of the sampling effort are reported in the Mist Net Report, which should be consulted for a detailed description of sampling methodology and results. A total of 56 mist net sites were surveyed along the about 45 miles of the proposed Phase I Project route in Orange and Rockland Counties. Five additional sites were netted along three proposed access roads that extended outside of the area covered by the route survey.

In total, 798 bats representing seven species were captured while netting the corridor. Thirteen Indiana bats were captured, including six males and seven females. Of these captures, four were reproductively active females and six were juveniles, indicating the presence of maternity colonies. Radio-transmitters were attached to 11 of these bats; six were tracked to a total of 11 roosts. An additional nine Indiana bats (including juveniles and reproductive females) were captured in a mist net as they emerged from a maternity roost on the evening of August 18, 2005. Seventeen (17) of the total 22 bats were banded. All captures of Indiana bats were in Orange County, New York and were located within an about 12.5-mile long portion of the Phase I Project. This portion of the Phase I Project corridor forms the core of the Indiana Bat Activity Area identified by the survey.

Two maternity roost colonies were identified among the 11 roosts discovered during the field survey. Three female Indiana bats were tracked to a cluster of seven trees within a 0.25-mile radius in the Town of Minisink. These trees were collectively considered one maternity colony (Maternity Colony 1). A fourth female Indiana bat was tracked to one roost tree and a nearby house in the Town of Warwick. Multiple reproductive Indiana bats were captured as they emerged from the house, verifying the presence of a maternity colony. Collectively, the house and nearby tree were considered one maternity colony (Maternity Colony 2).

Males, non-reproductive females, and juveniles were apparently utilizing the remaining roosts identified during the survey.

Summary of Impact

A detailed evaluation of potential impacts of the Phase I Project on the Indiana bat is presented in the Phase I Indiana Bat BA. The following is a brief summary of the findings contained in that document.

Potential impacts from the Phase I Project to the Indiana bat arise primarily from tree clearing performed within the CWA prior to construction. Winter hibernacula do not occur in the vicinity of the Phase I Project. Therefore, the Phase I Project would not affect hibernacula, would not affect the Indiana bat during hibernation, and would not affect spring staging or autumn swarming activities of the species.

Indiana bats are not known to occur in the vicinity of the Phase I Project during the migratory/transient period, although suitable habitat is available. During transient periods, Indiana bats use a wide variety of habitats and roosts and could use all wooded habitats in the vicinity of the Phase I Project. Thus, the Phase I Project could potentially affect migratory individuals through the removal of suitable roost trees. Since the number of suitable roost trees in the vicinity of the Phase I Project is very large in

comparison to the number of trees being removed from the CWA, this effect would be minimal.

The roost trees identified during the field survey all lie outside of the CWA for the Phase I Project. Thus, the Phase I Project would not result in direct impacts to roosting bats or result in the removal of known roosts. However, the possibility exists that unknown roosts may lie within the CWA. Thus, the Phase I Project could potentially affect summer roosting opportunities for the Indiana bat. However, since the number of suitable roost trees in the vicinity of the Phase I Project is very large in comparison to the number of trees being removed from the CWA, this effect should be minimal.

The habitat loss resulting from the removal of trees within the CWA would not result in measurable impacts to the Indiana bat. The amount of affected habitat is very small in comparison to the amount of available habitat.

Fragmentation of habitat and disruption of connectivity of suitable habitats for the Indiana bat would not result in measurable impacts to the species. Most of the tree clearing would take place along an existing corridor and would not result in the creation of new corridors through previously undisturbed forest. In addition, the Indiana bat tends to utilize corridors and edges as feeding habitat. Thus, the effects of creating new edge habitat are not all adverse.

The tree clearing within the CWA would not measurably affect the suitability of the habitat surrounding nearby maternal colonies. The Phase I Project would not affect the maternal colonies identified during the field survey.

The effects from construction activity could potentially affect individual Indiana bats. However, these effects would not result in measurable impacts to the species.

Finally, cumulative impacts due to the removal of trees for the Phase I Project and for other likely reasons in the vicinity were judged to be negligible. A large amount of protected public land exists in the immediate vicinity of the Phase I Project. Thus, although a fairly substantial amount of residential development is occurring in the area, suitable habitat would remain abundant.

In May 2006, Millennium filed an Environmental Supplement with the FERC for modifications to the Laurel Ridge Route Variation and the Ramapo River HDD Variation, including changes to proposed storage yard locations. These areas were encompassed by the above Indiana bat surveys in 2005. Neither Variation is within an area identified as an Activity Area for the Indiana bat. In addition, the Ramapo River HDD Variation would affect less forest land during construction than either the Line A-5 Replacement route or the originally certificated route. Therefore, we believe that the Ramapo River HDD Variation would have less potential impact on the Indiana bat than either of the other previously proposed routes.

Alternatives Considered

Alternative routes to avoid the area inhabited by the Indiana bat were not considered by Millennium. Little is known about the distribution of the species, except during hibernation. Thus, there is not enough data available to make informed decisions concerning the avoidance of areas used by the species.

Millennium has discussed potential Phase I Project impacts on the Indiana bat with representatives of the FWS on a number of occasions, including meetings held on May 16, 2005 and November 30, 2005. In addition, a meeting was held in the field with FWS on July 21, 2005 to discuss the results of the on-going field survey. During those meetings, Millennium has proposed to modify clearing plans for the Phase I Project to minimize impacts to the species.

Millennium is proposing to remove trees within the Indiana Bat Activity Area during the time when

the species is in hibernation. This would eliminate the potential for a direct take of individuals and minimize the overall impacts of the Phase I Project to the species. In addition, operation and maintenance activities with the potential to adversely affect individuals would similarly be scheduled for a time when the species is in hibernation.

The following design features are incorporated into the Phase I Project to avoid and minimize the potential for adverse effects on the Indiana bat and suitable habitat from construction, operation, and maintenance activities.

- Millennium would avoid all direct and indirect impacts to all known roosts used by adult male Indiana bats, adult female Indiana bats, or juvenile Indiana bats (or any combination thereof), during construction, operation, and maintenance of the right-of-way (ROW).

- The Phase I Project would utilize the existing Columbia Line A-5 ROW for most of its length in Orange and Rockland counties. Construction through this area would be by the lift-and-lay method. The existing cleared and maintained ROW would be used for much of the CWA to minimize the loss of adjacent woodland habitat.

- During construction, operation, and maintenance, Millennium and its contractors would follow strict guidelines dictating the use and handling of hazardous materials and other contaminants, which would minimize the potential for downstream impacts to water quality and/or the bat prey base. These procedures are identified in Millennium's ECS prepared specifically for the Phase I Project.

- Millennium would implement comprehensive sediment and erosion control measures in accordance with the ECS prepared specifically for the Phase I Project. These efforts would avoid down-stream impacts to waterways potentially used by bats.

- Millennium would promptly restore and revegetate the CWA in accordance with the ECS.

- The portions of the CWA outside of the permanent maintained ROW would be permitted to revegetate, at the discretion of the landowner. Therefore, forest may become re-established within areas cleared for the CWA. The CWA is typically 75 feet wide, and the permanent maintained ROW is typically 50 feet wide.

- Full width vegetation maintenance clearing would not be done more frequently than every three years. ROWs are generally maintained by mowing or other mechanical means. Herbicides would not be used. This would reduce the potential for contaminated runoff and adverse impacts to the bat, water quality, or the aquatic prey base.

- Future maintenance activities that involve tree removal, limbing/pruning, or similar activities, would be scheduled between October 1 and March 30 to avoid disturbing roosting bats.

- Millennium would obtain the services of a qualified bat scientist to investigate trees for the presence of Indiana bats if removal of a limited number of trees is required between April 1 and September 30, which would avoid a take of bats.

In addition to these modifications to the Phase I Project construction, operation, and maintenance plans, the following identifies conservation features Millennium would use to benefit the Indiana bat and aid its recovery in the vicinity of the Phase I Project:

- Special construction and restoration procedures would be utilized at all stream crossings in

accordance with the provisions of the 404 Permit, 401 Water Quality Certification, and Millennium's ECS. The preservation, restoration, and enhancement of streams under these permits may provide foraging and roosting habitat, and maintain and improve downstream water quality and the prey base of the bat.

- Special construction and restoration procedures would be utilized at all wetland crossings in accordance with the provisions of the 404 Permit, 401 Water Quality Certification, and Millennium's ECS. The preservation, restoration, and enhancement of wetlands under these permits may provide foraging and roosting habitat, and maintain and improve downstream water quality and the prey base of the bat.

Determination of Effect

A detailed Determination of Effect presentation is contained in the separate Phase I Indiana Bat BA. To summarize, the FERC has determined that the Phase I Project may affect, but is not likely to adversely affect the Indiana bat. This finding is based on:

- an avoidance of a direct take of individuals through a seasonal restriction of clearing in the Bat Activity Area;
- an abundance of suitable habitat remaining in the Action Area and Bat Activity Area after development;
- complete avoidance of any known Indiana bat roosts during construction, operation, and maintenance;
- an absence of primary maternity roosts within the CWA (proven by an extensive radio-telemetry survey); and
- discountable and insignificant effects to Indiana bats from potential losses of unknown male roosts and unknown secondary maternity roosts within the CWA.

Empire Connector

Field Survey Methodology and Results

In correspondence dated January 4, 2005, Empire provided the FWS with detailed information on the proposed Empire Connector pipeline route. The FWS, in a letter to Empire dated January 31, 2005, stated that the Indiana bat is known to occur at a hibernaculum in Onondaga County about 50 miles from the proposed Empire portion of the NE-07 Project, and may disperse from the hibernaculum in the Finger Lakes region of New York State. Therefore, there would be a possibility that Empire project construction might adversely affect habitat (predominantly trees with exfoliating bark and snags) used as roosts by Indiana bats when they disperse each spring from the Onondaga County hibernaculum.

However, after evaluating the details of the proposed route submitted by Empire, and the most recent FWS information on the movements of bats emerging from hibernacula in New York State and across the bat's range, the FWS further stated that although the Empire Connector Project may impact Indiana bat habitat, those impacts are extremely unlikely to occur, are discountable, and no further consultation with the FWS would be necessary for the Indiana bat. Therefore, Empire did not conduct surveys for the species.

Summary of Impact

Based on FWS information on the movements of Indiana bats emerging from the nearest hibernaculum to the proposed Empire Connector Project route, we feel that impacts to the species are unlikely to occur.

Determination of Effect

The FERC staff has determined that construction and operation of the proposed Empire Connector portion of the NE-07 Project would be unlikely to adversely affect the Indiana bat or any suitable habitat of the species.

Algonquin Ramapo Expansion

Field Survey Methodology and Results

In a letter dated October 21, 2005, the FWS indicated the potential for the Indiana bat to occur within Algonquin's proposed Ramapo Expansion Project areas. In particular, the FWS stated that known hibernacula occur within 47 miles of the proposed 4.7 mile pipeline replacement in the Towns of Ramapo and Haverstraw, Rockland County, New York; within 43 miles of the Southeast CS site in Putnam County, New York; and within 44 miles of the Stony Point CS site in Rockland County, New York. In addition, a known hibernaculum occurs within six miles of the proposed Hanover CS in Morris County, New Jersey.

Algonquin has stated that it would conduct Indiana bat field surveys between May and August of 2006 of the project locations identified as potential habitat. Results from those surveys are pending.

Summary of Impact

Because results of Algonquin's Indiana bat field surveys are pending, no assessment of impact to the species or its habitat has been made.

Determination of Effect

The FERC staff cannot make a determination of effect until it evaluates the results of the 2006 field surveys for the Indiana bat.

Iroquois MarketAccess

Field Survey Methodology and Results

In correspondence dated March 28, 2006, the FWS stated that there was the potential for the Indiana bat to occur at the Dover CS site in Dover, New York. As a consequence of its former use, the vegetation of the site around the Dover CS is mostly open and consists of successional old field habitat. The eastern extent of the project does encroach near a portion of mixed upland hardwood forest between the open field and the railroad, however, no clearing of this habitat is proposed.

Developed land and mowed lawn within the existing station fencing account for about 0.6 acres (22.2 percent) of the Dover, NY project area. The balance of the project area outside the fence is successional old field habitat. The work areas for the proposed cooler facility installation outside of the existing Dover CS would occur within successional old field habitat.

Because Iroquois does not plan to do any tree clearing during construction at the site, Iroquois did not conduct any surveys for the Indiana bat.

Summary of Impact

Because no tree clearing would be done at the Dover CS site and construction would occur within successional old field habitat, we feel that there would be no impacts to the Indiana bat or its summer roosting and migratory habitat.

Determination of Effect

The FERC staff has determined that construction and operation of the proposed Iroquois MarketAccess Project would not affect the Indiana bat or any suitable habitat of the species because no tree clearing would occur at the site where the Indiana bat has the potential to occur.

Overall Determination of Effect For the Indiana Bat

The FERC staff has determined that the Millennium Phase I Project may affect, but is not likely to adversely affect the Indiana bat. The Empire Connector and Iroquois MarketAccess components of the NE-07 Project are unlikely to adversely affect the Indiana bat. However, we cannot make an Indiana bat overall determination of effect for the NE-07 Project until Algonquin completes its surveys for the Indiana bat and reports its findings to the Commission.

3.4 Bald Eagle

Background

The bald eagle was federally listed as endangered within most of the U.S., including New York, on March 11, 1967. On July 12, 1995, the status of the bald eagle was changed to threatened within the lower 48 states. On July 4, 1999, a proposal to delist the bald eagle was announced, but it has not been delisted yet. The reasons for the decline of the bald eagle population are varied and include effects of organochlorine compounds on reproduction, effects of heavy metals and other toxicants, killing by humans, and general loss of habitat. Most of these threats continue to adversely affect bald eagle populations today, although organochlorine pesticides have been banned for use within the U.S. and indiscriminate killing of bald eagles is a federal crime. The bald eagle is also listed as a state endangered species in New York.

The range of the endangered bald eagle is restricted to North America. Populations in Alaska and western Canada have been relatively stable through time. However, populations elsewhere exhibited gradual declines primarily due to loss of habitat until the 1940s. Following the development and widespread use of organochlorine pesticides, the populations within the lower 48 states dropped precipitously. Since the regulation of the use of organochlorine pesticides in the 1970s, the numbers of bald eagles have gradually risen in most of the species' former range. In New York, a number of bald eagle nesting sites are presently known. In addition, bald eagles congregate during the winter at several sites within the state.

The life history of the bald eagle is well documented. Bald eagles nest in mature trees along oceans, lakes, rivers, and swamps. They generally prefer to nest in white pine, sycamore, red oak, or red maple trees. Bald eagle pairs exhibit a high degree of fidelity to nesting sites, often returning to the same nest year after year. Nesting in New York generally occurs in April and fledging of the young generally follows in mid-to-late summer. Bald eagles feed primarily on fish. However, bald eagles would also take small mammals and birds, and feed opportunistically on carrion. Perching locations are generally located along the waterbodies where feeding activity takes place. Roosting locations are often found in the general vicinity of nesting locations. Bald eagles follow typical north-south seasonal migration patterns and winter in suitable habitats, mainly along wide rivers, from southern Canada southward.

Nesting activity in New York is presently occurring at the following locations:

- near the east end of Lake Erie and in other western New York counties;

- along the Lake Ontario shoreline and in the Finger Lakes region in the central part of the state;
- along Lake Ontario and St. Lawrence River in the northern portion of the state;
- in the central Hudson River valley; and
- along the West Branch Delaware River and the Delaware River in the eastern portion of the state.

Wintering areas include the Lake Ontario shoreline, the St. Lawrence River, the Hudson River Valley, the Delaware River valley, and major tributaries to the Hudson and Delaware Rivers. Based on information received from the FWS, NYSDEC, and the NYSDEC's New York Natural Heritage Program (NYNHP) in 2004 and 2005, the NE-07 Project facilities would cross four counties with known bald eagle nesting or wintering activity: Delaware, Sullivan, and Orange counties in New York; and Morris County in New Jersey. The NYNHP has identified two nesting locations within Sullivan County that are in the vicinity of the Phase I portion of the project: Lebanon Lake and Rio Reservoir. In addition, during fieldwork in the spring of 1999, Millennium observed an active bald eagle nest near the West Branch Delaware River. The NYNHP has also indicated that wintering activity is known to occur along the East Branch Delaware River in Delaware County and the Mongaup River and Neversink River in Orange County. The FWS has requested that specific location information be kept confidential.

Based on information received from the NYSDEC, bald eagle activity in the vicinity of the pipeline at the Mongaup/Rio Reservoir location includes nesting, feeding, and overwintering. At the remaining locations, bald eagles are potentially present and any bald eagles found at these locations are most likely to be engaged in feeding, perching, or roosting activity.

Project Components In the Vicinity of the Bald Eagle

Millennium Phase I

Field Survey Methodology and Results

Because the locations of bald eagle use areas are known, Millennium did not conduct surveys for the bald eagle. According to correspondence between Millennium and the NYSDEC, field surveys for the bald eagle have not been requested (NYSDEC 1998b and 1998c).

Summary of Impacts

Potential effects on bald eagles using activity areas affected by the Phase I portion of the NE-07 Project could possibly occur from three aspects of project construction and maintenance: 1) ROW tree clearing and maintenance within a bald eagle activity area could remove bald eagle perching, roosting, and/or nesting habitat, 2) construction of waterbody crossings within the bald eagle activity areas could adversely affect bald eagle feeding activity, and 3) the presence of construction equipment and personnel within a bald eagle activity area could disturb and result in the temporary displacement of bald eagles in the immediate area.

The clearing and removal of trees within any of the bald eagle activity areas may affect perching or roosting habitat for the species. However, these effects would be localized and there is ample adjacent forest. Because perching and roosting is not a limiting factor for the bald eagle in these activity areas and most of the clearing would take place adjacent to existing ROWs, forest clearing for the Phase I portion of the NE-07 Project should not adversely affect bald eagle habitat.

The adverse effects on aquatic resources from open-cut crossings of waterbodies are due primarily to direct and indirect impacts from trenching and elevated levels of suspended solids. Generally, these effects have been found to be spatially limited to the immediate vicinity of the crossing location and temporally

limited from days to months following completion of construction activities. Alteration of benthic macroinvertebrate and fish distributions would be short term with recovery of the benthic macroinvertebrate communities occurring within 2 to 12 months (Reid and Anderson 1998). Fish displaced from the vicinity of the waterbody crossing would return to the area within several weeks of restoration of the CWA. The only waterbodies proposed for open cut in known eagle habitat are the East Branch Delaware River (a conventional bore and open trench with diversion crossing), and the Mongaup River/Rio Reservoir. These rivers all support large populations of biological resources and the impact of open-cut crossings on prey of bald eagles would be temporary and localized, with adequate forage opportunities nearby. Additionally, the extent of turbidity created by construction in the stream would not significantly affect foraging opportunities because eagles prey on food at the water surface, which would still be visible even in highly turbid water. Therefore, the proposed construction would not significantly restrict feeding opportunity or limit food availability for bald eagles.

Construction activities may temporarily affect bald eagle distributions within all of the identified activity areas. Construction equipment, vehicles, and construction personnel would be present in each of the activity areas during construction. Construction equipment noise would be generated and the level of human activity in these areas would be significantly increased. Several recent publications have examined the effects of various human activities on bald eagles. These studies have been prompted primarily by issues pertaining to management of public lands containing both bald eagle populations and recreational opportunities. Typically, bald eagles are displaced (flushed) from perches by human activity (Steidl and Anthony 1996, Stalmaster and Kaiser 1998). The rate of displacement and the distance that birds are displaced appears to be related to a large number of variables, including the distance at which the human activity is first visible, how near human activity is to the eagle, the type of disturbance, the age of the eagle, the general background rate of human activity in the area, the time of day, and the type of activity the eagle is engaged in.

Bald eagles were generally found to react more strongly to hikers than to vehicles of various sorts (motorized boats, non-motorized boats, and airplanes) (Stalmaster and Kaiser 1998). Eagles that were disturbed were generally found to be displaced by 300 to 600 feet (Steidl and Anthony 1996). Stalmaster and Kaiser found that overwintering eagles perched along a shoreline were generally displaced away from the shoreline by human disturbance. They also found some indication that feeding activity may be interrupted by repeated human disturbance. At this time, there is no predictive model for estimating bald eagle responses to human disturbance. However, it is expected that construction activities may temporarily displace bald eagles away from the project areas during construction.

The potential effects of the Phase I portion of the NE-07 Project on the bald eagle within each of the five bald eagle activity areas are discussed below.

Cannonsville Reservoir - The pipeline would cross the Cannonsville Reservoir bald eagle activity area in the vicinity of the West Branch Delaware River. Part of this section of the Phase I Project is within the adjacent Delaware River bald eagle activity area, which is discussed below. The pipeline would cross the Cannonsville Reservoir bald eagle activity area for a distance of about 1.7 miles. About 6.1 acres of forest land would be cleared during construction. Of this, about 2.4 acres of this forest land would be permanently cleared and the remaining 3.7 acres would be allowed to revert to forest following construction. This entire segment of the pipeline would be constructed adjacent to existing ROW, with the exception of a small section at the crossing of the West Branch Delaware River. All of the affected forest land is well away from the river, and no significant adverse effects to potential perching or roosting trees are expected. The presence of construction personnel and equipment within the activity area could disturb and result in the temporary displacement of bald eagles using the area.

The pipeline would cross two waterbodies (Butler Brook and West Branch Delaware River) within the Cannonsville Reservoir bald eagle activity area. Both are perennial streams and both would be crossed using dry construction techniques. The NYSDEC stated that no adverse effects are anticipated to occur to the

bald eagle within this activity area and did not recommend any specific compensation measures.

Delaware River - The pipeline would parallel the West Branch Delaware River and the Delaware River and would be close enough to these rivers to be considered within the activity area associated with these rivers at seven locations. The first of these areas was discussed above as part of the Cannonsville Reservoir bald eagle activity area. The remaining locations are discussed below.

The pipeline would cross a total of about 12.8 miles of the Delaware River bald eagle activity area at six locations. Within these six locations, about 47.0 acres of forested land would be cleared during construction of which 4.6 acres would remain permanently cleared. The remaining 42.4 acres would be allowed to revert to forest following construction. The pipeline would be adjacent to or within existing ROW in all of the bald eagle activity areas, except for one location where the pipeline would deviate from the existing ROW to avoid a residence. Some potential perching and roosting habitat could be affected, but this impact should not be significant. The presence of construction personnel and equipment within the activity area could temporarily disturb and displace bald eagles using the area for perching and roosting. Although Millennium observed an eagle nest near the West Branch Delaware River in Spring 1999, the nest was 2,500 feet from the area that would be disturbed by construction of the Phase I Project. The critical zone of protection for acceptable eagle nesting conditions generally extends from the nest to a distance of about 1,500 feet. The temporary activity from the project would not likely disturb the eagles using this nest.

The pipeline would cross 29 waterbodies (8 perennial and 21 intermittent streams) within the Delaware River bald eagle activity area. Dry crossing methods are proposed for all of these crossings. Millennium reported that Callicoon Creek was the only perennial stream in which fish were observed during field surveys. The construction of perennial stream crossings may temporarily affect the distribution of fish within the immediate vicinity of the Phase I Project, but the project would have no permanent adverse effect on fish populations. In addition, most of these streams are not large enough to provide bald eagle foraging habitat. Therefore, the Phase I Project is not expected to affect feeding opportunities for the bald eagle within the Delaware River activity area. The NYSDEC stated that no adverse effects are anticipated to occur to the bald eagle within this activity area and did not recommend any specific compensation measures.

Lebanon Lake - The pipeline would cross the Lebanon Lake bald eagle activity area for a distance of about 0.9 mile. About 7.1 acres of forest land would be cleared for construction, of which about 1.4 acres would remain permanently cleared. The other 5.7 acres would be allowed to revert to forest following construction. Some potential perching and roosting habitat could be affected, but this impact is not considered significant due to the abundance of adjacent similar habitat. The presence of construction personnel and equipment within the activity area could disturb and result in the temporary displacement of bald eagles using the area.

The Lebanon Lake bald eagle activity area crossing would be mostly in a lift and lay section of the Phase I Project. Therefore, the permanent ROW would coincide with an existing ROW, except at the eastern end where the proposed route would deviate from the existing ROW to avoid an active timber rattlesnake den.

The pipeline would cross one perennial stream within the Lebanon Lake bald eagle activity area. This would be a dry crossing although the stream is probably too small to serve as a food source for resident bald eagles. Therefore, the project would not likely affect feeding opportunities for the bald eagle within the Lebanon Lake activity area. The NYSDEC stated that no adverse effects are anticipated to occur to the bald eagle within this activity area and did not recommend any specific compensation measures.

Mongaup River - The pipeline would cross the Mongaup River bald eagle activity area for a distance of about 1.6 miles. About 6.0 acres of forest land would be cleared for construction, but all would be within the temporary ROW and allowed to revert to forest after construction. Some potential perching and roosting

habitat may be impacted temporarily, but the impact should not be significant due to the presence of similar adjacent habitat. The presence of construction personnel and equipment within the activity area could disturb and result in the temporary displacement of bald eagles using the area.

The Mongaup River bald eagle activity area crossing would be in a lift and lay section of the Phase I Project. Therefore, the permanent ROW would coincide with an existing cleared ROW, except within the Mongaup River/Rio Reservoir crossing, which would be offset slightly from the existing pipeline. The Mongaup River bald eagle activity area lies within the Mongaup Wildlife Management Area (WMA) and contains active bald eagle nests. It is also an important overwintering location because sections of the Rio Reservoir remain ice-free during the winter, thereby providing feeding opportunities for the bald eagles. Bald eagles congregate in the vicinity of the reservoir beginning in early December. Overwintering bald eagles were observed adjacent to the Phase I Project area during field surveys.

Millennium proposes to replace the permanent boat launch at the Mongaup River/Rio Reservoir after completing pipeline construction across this waterbody. The FWS stated that the current boat launch is near a bald eagle nest and roosting area, and the new launch should be built so that it does not disturb the eagles, or the nest and roost areas (FWS 1999b).

The pipeline would cross two perennial streams within the Mongaup River bald eagle activity area, the Mongaup River, and a small tributary to the river. Millennium determined that directional drilling the Mongaup River crossing would not be feasible due to subsurface geological conditions. Because of the length of the crossing and the adjacent topography, Millennium now proposes to cross the Mongaup River by the open-cut method. The tributary to the Mongaup River would be crossed by the dam and pump method. Both crossings would be done between October 15 and November 30.

It would be expected that fish populations may be temporarily displaced from the vicinity of the Phase I Project during construction of the open-cut crossing of Mongaup River. However, there is no evidence to show that fish mortality would increase in the vicinity of the project. Thus, the effect on bald eagle feeding opportunities within the reservoir activity area is not expected to be significant or of long duration.

The Mongaup River crossing would be within the Rio Reservoir, a hydroelectric generating facility. Historically, dissolved oxygen depletion has occurred in the hypolimnion of this impoundment during summer months. Generally, oxygen depletion in deeper waters follows the onset of thermal stratification within the reservoir. This situation prevails until the thermocline dissipates in the fall. At that time, the oxygen-depleted waters of the hypolimnion mix with the oxygenated waters of the epilimnion during fall turnover. During the thermal stratification of Rio Reservoir, oxygen-depleted, colder waters of the hypolimnion may not be capable of supporting a fish population. Fish distribution within the reservoir would be restricted to the warmer, better oxygenated surface waters. This would limit the availability of suitable habitat for coldwater fish species such as trout.

The open-cut crossing of the Mongaup River at Rio Reservoir could potentially disturb the distribution of oxygen-depleted waters if the crossing was conducted when the reservoir was thermally stratified (i.e., summer or winter). The mixing of oxygen-depleted waters with surface waters that offer the major suitable habitat for fish in the reservoir could result in reduced oxygen levels in the surface waters. However, construction would be scheduled for the fall (October 15 to November 30) when this effect should be reduced. In addition, disturbance would be limited to the immediate area of the reservoir crossing, affecting only between 1.1 and 1.5 acres of this large reservoir complex (11,967 acres) that extends for several miles north and south of the proposed crossing. Construction is not expected to have any significant effect on the foraging opportunities of overwintering bald eagles nor on an abandoned wooden structure in the Mongaup River, north of the pipeline. This structure consists of a series of timbers and beams extending into the Rio Reservoir and serves as an important perching location for bald eagles. It would not be affected by

construction.

The NYSDEC requested that there be no construction in areas adjacent to the Mongaup River between December 1 and July 31 to avoid the bald eagle nesting and overwintering periods in this activity area. Millennium proposes to construct within this activity area from August 1 to November 30. However, the FWS requested that Millennium coordinate with the FWS on the construction time schedule (FWS 1999b). The result of this coordination was an agreement to construct the crossing of the Mongaup River between October 15 and November 30.

Determination of Effect

At the Mongaup River/Rio Reservoir, the FERC recommended conditions to the 2001 Certificate that Millennium must file site-specific compensation plans for the Mongaup WMA, and that it consult with the FWS regarding the site-specific plan being developed with the NYSDEC for the proposed new permanent boat launch facility at the Mongaup River/Rio Reservoir. The FERC also indicated that impact may occur where blasting is required in eagle activity areas and recommended a condition to the Certificate that, if blasting is required in designated bald eagle activity areas, Millennium must develop a construction plan in consultation with the NYSDEC and FWS that includes the potential amount, exact location, and schedule of the required blasting.

Millennium has incorporated the FERC conditions to the Certificate for the Millennium Pipeline Project into the construction plan for the Phase I Project where applicable. Millennium continues to coordinate with the FWS and NYSDEC to obtain the concurrence of those agencies with the proposed construction plans.

With those conditions in place and agreed to by the agencies, we believe the proposed Phase I Project would not adversely affect or jeopardize the continued existence of the bald eagle.

Algonquin Ramapo Expansion

Field Survey Methodology and Results

Nest sites of bald eagles are documented in New York and New Jersey. However, only transient bald eagles have been identified by the FWS as potentially occurring at the Hanover CS and Hudson River Valve Site. There are no known bald eagle nest sites in close proximity to any component of the Algonquin Ramapo Expansion portion of the NE-07 Project. Therefore, Algonquin did not conduct surveys for the bald eagle.

Summary of Impacts

Because no known bald eagle nest sites occur in the vicinity of the Algonquin portion of the NE-07 Project, and only transient bald eagles have been observed, we believe that there would not be any impacts on the bald eagle for this portion of the project.

Determination of Effect

The FERC staff has determined that construction and operation of the proposed Algonquin Ramapo Expansion Project would not likely adversely affect the bald eagle or any suitable habitat of the species because no nest sites or resident eagles are known to occur at the proposed facilities.

Overall Determination of Effect For the Bald Eagle

The FERC staff have concluded that construction and operation of the NE-07 Project would not likely

adversely affect the bald eagle or any suitable habitat of the species, as long as Millennium implements the agreed-to construction and mitigation conditions for the Phase I Project.

3.5 Bog Turtle

Background

The bog turtle was listed as a federally threatened species on November 4, 1997. The primary reason for the listing of this species is its limited distribution due to its restrictive habitat requirements and destruction of suitable habitat. The main threats to the species are habitat modification and destruction, and over-collecting for the pet trade. The bog turtle is also listed as a state-endangered species in New York.

The bog turtle occurs in two disjunct populations. The northern population originally occupied portions of western Pennsylvania and the Lake Ontario Plain and Finger Lakes region of New York. These areas generally no longer contain known populations of the species. The remaining northern population of the bog turtle occurs in a narrow band that includes western Massachusetts, western Connecticut, southeastern New York, southeastern Pennsylvania, New Jersey, northern Maryland, and northern Delaware. The southern population of the bog turtle inhabits the Appalachian Mountain region from southern Virginia to northern Georgia. Recent trends indicate that bog turtles are declining at many of the remaining locations within the northern population.

The bog turtle is a small, secretive turtle that spends much of its life in hibernation. Bog turtles excavate hibernacula by burrowing into soft mud and they hibernate at depths of 2 to 22 inches (Ernst et al. 1989). Muskrat burrows and meadow vole burrows may also be enlarged and used (Ernst et al. 1989). In New York, the bog turtle generally emerges from hibernation in mid-April, or when both air and water temperatures are generally above 50 degrees. Bog turtles typically feed upon insects, larvae of aquatic insects, snails, nematodes, millipedes, seeds, and carrion. Bog turtles may live 30 or more years.

Mating takes place in spring, either within the hibernaculum or shortly after turtles emerge from hibernation. Female bog turtles generally become sexually mature at 5 to 8 years of age, although females may not mate successfully every year. Eggs are laid within the wetland, but out of the water. In New York, eggs are deposited in early June and nests are often found on sedge tussocks in strong sunlight. Eggs hatch in 42 to 56 days and the young may overwinter near the nest. Adults return to the hibernacula in October.

Bog turtles are rarely found far from wetlands and appear to require fairly specific habitat characteristics. The wetlands generally need a combination of herbaceous vegetation (including sedge tussocks), sparse to moderate shrub growth, a reliable source of water providing permanent saturation and some inundated areas, a mosaic of wetter and dryer areas, and soft mud and/or stony substrate (Chase et al. 1989).

Natural plant succession processes have been cited as having an adverse effect on bog turtles at certain sites. The species apparently requires exposure to fairly strong sunlight. Thus, seasonally or moderately grazed pastures have been identified as favorable habitat for the species since grazing prevents establishment of trees or dense shrubs. In addition, the introduction of exotic plant species into wetlands has been identified as having a possible adverse effect on bog turtles. In portions of New York, purple loosestrife and common reed (*Phragmites australis*) are common within wetlands.

In New York, historical records for bog turtles indicated they occurred in 17 counties, including Sullivan, Orange, Rockland, and Westchester Counties where proposed project construction would be built. The species is currently known to occur in Orange County, but no bog turtle populations are currently known to occur in Sullivan, Rockland, and Westchester Counties.

Project Components In the Vicinity of the Bog Turtle

Millennium Phase I

Field Survey Methodology and Results

The bog turtle was identified in correspondence received from the FWS in 1997 through 2000 as potentially occurring in the vicinity of the Millennium Pipeline Project. The BA issued by the FERC for the Millennium Pipeline Project found that construction and operation of that project would not adversely or jeopardize the continued existence of the bog turtle. The FWS conditionally concurred with this finding in correspondence dated April 18, 2002. The FWS response was conditioned on the avoidance of construction impacts to a portion of one wetland in Orange County. In 2005, the agency also identified the bog turtle as a species that potentially occurs in the vicinity of the Phase I Project.

Information about the possible occurrences of bog turtles is not consistent. In 1997 through 1999, the NYNHP indicated that the Millennium Pipeline Project would be in close proximity to one known bog turtle site in Westchester County on the east bank of the Hudson River. However, the FWS indicated that bog turtles no longer occur in Westchester County (FWS 1997). Millennium consulted the NYSDEC and requested identification of suitable habitat for the bog turtle in the vicinity of the proposed project. The NYSDEC indicated that there are no known areas where the pipeline would significantly impact the bog turtle, and that no surveys for this species would be required (NYSDEC 1998a). As a result of consultations with the FWS in April 1999, Millennium conducted field surveys of 18 wetlands within two segments of the ROW in Orange County where the FWS believed populations of bog turtles or their habitat may occur. Both segments are within the area where the pipeline would be removed and replaced in the same ditch. If potential bog turtle habitat exists in these two areas, the FWS requested that field surveys be conducted to determine if bog turtles exist within the proposed CWA.

Millennium identified and delineated wetlands during the fall of 1997, including the two segments in Orange County that the FWS believed may contain bog turtles or suitable habitat. Access was obtained to survey the entire CWA in all but one of the 18 wetlands within the two segments. All of these wetlands were revisited in May and June 1999 to determine whether the habitat is suitable for bog turtles. The 1999 field surveys indicated that the wetlands fell into three categories: wetlands that were too dry to provide suitable habitat for bog turtles; wetlands that contained streams or were within agricultural drainage ditches, but that were unsuitable for bog turtles due to the absence of appropriate vegetation and cover; and wetlands that were outside of the CWA. The NYSDEC commented that it would review the areas surveyed and work with Millennium to resolve any concerns with respect to this species (NYSDEC 1999). In a subsequent field meeting, held in August 1999 with representatives of Millennium, FWS, and NYSDEC, one suitable bog turtle habitat was identified in a portion of one forested wetland.

Additional correspondence and coordination was conducted with the FWS, NYNHP, and NYSDEC in 2004 and 2005 concerning the potential presence of the bog turtle in the vicinity of the Phase I portion of the NE-07 Project. The FWS indicated that the species was known to occur in the vicinity of the Phase I Project in Orange County and requested that a Phase I habitat survey be conducted in the project-area wetlands in Orange County to determine if suitable habitat for the species existed. The NYNHP indicated that one known site in Orange County was in the vicinity of the Phase I Project.

Following additional coordination with the agencies, a Phase I habitat survey was conducted in Orange County. This new field survey was conducted using the *Guidelines for Bog Turtle Surveys* found in Appendix A of the *Bog Turtle Northern Population Recovery Plan* (FWS 2001). It should be noted that this standardized methodology was not available at the time that the previous survey was performed in 1999.

In the spring and fall of 2005, the Phase I habitat survey was conducted in all but two of the wetlands

affected by or immediately adjacent to the Phase I portion of the NE-07 Project. The two wetlands that were not surveyed were not accessible due to refusal of the landowner to grant access for the survey.

The detailed findings of the Phase I habitat survey are contained in the separate Millennium report, *Phase I Bog Turtle Habitat Assessment Report*. A summary of the results follows.

During the performance of the survey, all portions of the Phase I Project route in Orange County that had not previously been field viewed at any time since the beginning of the Millennium Pipeline Project in 1997 were examined in addition to all known wetlands. As a result, 82 locations were examined for potential bog turtle habitat, including five new wetlands that were previously not known to exist. Five wetlands previously identified remotely through examination of aerial photography were found not to exhibit appropriate characteristics and were determined not to be wetlands.

Of the 77 wetlands examined in Orange County, two were found to contain potential bog turtle habitat. These wetlands are Wetland W595 (MP 347.7) and Wetland W611 (MP 359.5). The remaining wetlands generally fell into three classes: those that lacked evidence of groundwater input and thereby did not exhibit suitable hydrology; those that did not exhibit mucky soils and thereby did not exhibit suitable soils; and those that exhibited neither suitable hydrology nor suitable soils. It should be noted that the one wetland that was identified in 1999 agency field views as potential bog turtle habitat did not exhibit suitable hydrology and was determined in the 2005 survey not to contain potential bog turtle habitat.

One of the two wetlands that contain potential bog turtle habitat, Wetland 595, exhibits suitable habitat within two breached man-made ponds. The hydrologic source is located within the dewatered pond substrates. Discussions with the landowner at the time of the survey indicated that the landowner was interested in rebuilding the ponds. If this occurs, the wetland would no longer offer suitable habitat for bog turtles. This wetland is located in an area of Orange County where no known bog turtle populations occur. Thus the likelihood of this wetland containing bog turtles is remote.

Wetland W611 offers suitable habitat in a portion of the wetland that lies outside of the CWA for the Phase I Project. In addition, the suitable habitat is separated from the CWA by a rock wall. Thus, potential impacts to the species may be mitigated by appropriate construction conditions.

Summary of Impacts

Impact on the bog turtle could include loss or displacement of individuals, and temporary or permanent loss of habitat. Two wetlands were identified within Orange County that offer suitable habitat for the species. Millennium has communicated the findings of the Phase I habitat survey to the FWS and has discussed methods of minimizing the potential impacts of the Phase I portion of the NE-07 Project on the species. These are summarized below.

Wetland W595: Millennium believes that the suitable potential habitat is temporary in nature. Further, the CWA does not include the portions of the wetland that presently exhibit appropriate characteristics. The wetland is not in proximity to any known bog turtle populations and is not likely to contain bog turtles. Therefore, Millennium believes that no additional conditions are required to prevent adverse impacts to the species at this location. The FERC staff concurs with this assessment.

Wetland W611: Millennium has proposed that a herpetologist qualified by the FWS and NYSDEC to handle bog turtles be on-site throughout the duration of construction activities within this wetland. This herpetologist would serve as a bog turtle monitor. The bog turtle monitor would examine the CWA prior to the initiation of any construction activities within the wetland and would remove the bog turtles (or any other reptiles) found within the CWA to the adjacent suitable habitat. Silt fence would be installed along borders of

the wetland prior to the initiation of any other construction activities to exclude access of turtles to the CWA. The bog turtle monitor would re-examine the CWA daily prior to the commencement of construction activities and would remove any bog turtles (or other reptiles) found within the CWA to the adjacent suitable habitat. All personnel performing construction activities would be trained to identify possible bog turtles and would immediately report any turtle within the CWA to the bog turtle monitor or environmental inspector. In the event of such a siting, all construction activities within the wetland would cease immediately until the turtle is removed to a safe place. In the event that a bog turtle is identified within the CWA or adjacent suitable habitat, the FWS and NYSDEC would be notified immediately.

Millennium believes that the Phase I portion of the NE-07 Project would not affect suitable bog turtle habitat. Further, with the above conditions in force, Millennium believes that the Phase I Project would not affect the bog turtle. The FERC staff agrees with these assessments. Millennium would continue to coordinate with the FWS and the NYSDEC to ensure that the proposed conditions on construction within Wetland W611 are sufficient to protect the bog turtle.

In May 2006, Millennium filed an Environmental Supplement with the FERC for modifications to the Laurel Ridge Route Variation and the Ramapo River HDD Variation, including changes to proposed storage yard locations. Because the Laurel Ridge Variation does not affect wetlands, potential bog turtle habitat does not exist within the area affected by the variation or the proposed modifications. The Phase 1 Habitat Survey conducted at wetland W634.1 along the Millennium certificated route concluded that this wetland did not contain habitat for the bog turtle.

Phase 1 Habitat Surveys for the bog turtle have been completed for all wetlands identified along the Ramapo River HDD Variation except WKDR-001. A survey of this wetland will be completed in May 2006. Results will be reported to the FWS and the Commission. Due to the topography and soil conditions present in the general area of the Ramapo River HDD Variation, it is unlikely that wetland WKDR-001 would contain habitat for the bog turtle. The Phase 1 Habitat Survey conducted at all other wetlands affected by the Ramapo River HDD Variation, the Line A-5 Replacement Project route and the certificated route did not identify suitable habitat for the bog turtle. Therefore, it is unlikely that the proposed modifications to the Laurel Ridge Variation or the Ramapo River HDD Variation will adversely impact the bog turtle or its habitat.

Determination of Effect

Based on the results of the Phase I habitat survey, the FERC staff concludes that construction and operation of the Phase I portion of the NE-07 Project would not affect suitable habitat for the bog turtle. Further, the FERC staff has determined that, with FWS and NYSDEC approval of the conditions on construction in Wetland W611, the Phase I Project is unlikely to adversely affect the bog turtle.

Algonquin Ramapo Expansion Project

Field Survey Methodology and Results

In 2005 correspondence, the FWS indicated to Algonquin that there was the potential for bog turtles to exist in the vicinity of the proposed pipeline replacement portion of the Ramapo Expansion Project, the Stony Point CS site, the Southeast CS site, and at the Oxford CS site. Consequently, Algonquin completed Phase I habitat surveys for bog turtles on the fall and winter of 2005-2006 along the entire 4.8 mile ROW of the replacement portion of the proposed project, and at each of the above-listed aboveground facility sites.

The detailed findings of the Phase I habitat surveys are contained in the separate Algonquin reports, *Ramapo, New York Phase I Bog Turtle Habitat Survey Report ; Stony Point, New York Phase I Bog Turtle Habitat Survey Report; Southeast, New York Phase I Bog Turtle Habitat Survey Report; Hanover, New Jersey Phase I Bog Turtle Habitat Survey Report;* and *Oxford, Connecticut Phase I Bog Turtle Habitat Survey*

Report. A summary of the results follows.

Ramapo, New York Pipeline Replacement

The Phase I survey for habitat was conducted on November 21, 2005. Five wetlands were located and surveyed along the 4.8-mile proposed pipeline replacement route. Only two wetlands along the project corridor, wetlands 1 and 2, met all three criteria for potential bog turtle habitat, although certain factors were of marginal quality. Wetlands 3, 4, and 5 were determined not to be potential bog turtle habitat.

Wetland 1: Wetland 1 is located at the southernmost end of the Algonquin project corridor. It extends for about 500 feet along the ROW and lies adjacent to the Mahwah River. Portions of this wetland that lie outside of the ROW are scrub-shrub and forested. The portion of the wetland within the ROW is emergent, with over half of the area dominated by common reed (*Phragmites australis*). Other emergent vegetation present includes tussock sedge (*Carex stricta*), woolgrass (*Scirpus cyperinus*), and skunk cabbage (*Symplocarpus foetidus*). This wetland meets the vegetation criteria for potential bog turtle habitat because it is not entirely overgrown with dense *Phragmites*. Wetland 1 had small pockets of surface water present and evidence of groundwater seepage, and therefore meets the hydrology criteria of potential bog turtle habitat. However, hydrologic conditions were not ideal (e.g. no subterranean channels in which turtles could hide). This wetland also had some mucky spots, and therefore meets the soil criteria for potential bog turtle habitat.

Wetland 2: Wetland 2 is located near the southern end of the Algonquin project corridor, just north of Wesley Chapel Road. A portion of this wetland is adjacent to the Mahwah River and includes a combination of forested, scrub-shrub, and emergent areas just outside the ROW. The portion of the wetland within the ROW is an emergent wetland that is traversed by an intermittent stream that channels flow between two off-site ponds. It is about 100 feet in length. This wetland is dominated by tussock sedge and woolgrass and meets the vegetation criteria for potential bog turtle habitat. This wetland had some soft muddy areas, but was not substantially mucky. It marginally meets the soil criteria for potential bog turtle habitat. It also had small pockets of surface water present and evidence of groundwater seepage, and therefore meets the hydrology criteria of potential bog turtle habitat. However, similar to Wetland 1, hydrologic conditions were not ideal.

Stony Point Compressor Station

A Phase I Survey for bog turtle habitat was conducted on February 1, 2006 within the approximate 16-acre site. The site consists of an existing CS with associated paved roads, parking areas and lawn, an existing meter station, and undeveloped land. A stream, an unnamed tributary to Cedar Pond Brook, flows through the western portion of the site. Three wetlands were identified from the wetland delineation conducted on the project site. These are briefly described below in terms of their vegetative, hydrologic, and soils characteristics and to whether or not they meet the criteria for potential bog turtle habitat.

Wetland W01-RK-08: This wetland is a palustrine-forested system. Its dominant plant species included red maple, slippery elm, pin oak, and silky dogwood. Therefore, it does not meet the vegetation criteria for potential bog turtle habitat. This wetland is located within the floodplain of an unnamed tributary to Cedar Pond Brook. No springs or groundwater seepage was evident, although there is likely a groundwater component. This wetland may or may not meet the hydrology criteria for potential bog turtle habitat. The mineral soils underlying this wetland were fairly firm throughout. Therefore, the wetland does not meet the soils criteria for potential bog turtle habitat either.

Wetland W01-RK-09: This wetland has a combination of forested, emergent, and scrub-shrub components. A sizable open emergent portion of the wetland included tussock sedge, sphagnum moss, tearthumb, monkey flower, and goldenrod. In the palustrine emergent portion, this wetland meets the

vegetation criteria for potential bog turtle habitat. This wetland is also located within the floodplain of a tributary to Cedar Pond Brook. Groundwater seepage was observed, as well as a small well house next to a man-made pond indicating the presence of a spring or groundwater close to the surface, so this wetland meets the hydrology criteria for potential bog turtle habitat. There were a number of substantially mucky areas throughout both the palustrine emergent and palustrine forested portions of this wetland. Therefore, the wetland meets all three criteria for potential bog turtle habitat.

Wetland W01-RK-10: This wetland is a combination of emergent and scrub-shrub components. Tussock sedge, rushes, and dogwood are prevalent. This wetland meets the vegetation criteria for potential bog turtle habitat. This wetland is also located within the floodplain of a tributary to Cedar Pond Brook. Groundwater seepage was observed; therefore, this wetland meets the hydrology criteria for potential bog turtle habitat. There were a number of substantially mucky areas within this wetland. Therefore, this wetland also meets all three criteria for potential bog turtle habitat.

Southeast Compressor Station

A Phase I Survey for bog turtle habitat was conducted on February 1, 2006 within the approximate 15 acre site identified by Algonquin. The project site is an existing CS and meter station with associated paved roads, parking lots, and lawn areas. The site included portions of the surrounding property, which is predominantly forested, except for the maintained natural gas pipeline ROW. A stream, an unnamed tributary to Haines Pond, flows through the western portion of the area. One wetland (W01-PT-001) was identified from the wetland delineation conducted on the project site. The wetland community is briefly described below in terms of its vegetative, hydrologic, and soils characteristics and whether or not they meet the criteria for potential bog turtle habitat.

Wetland W01-PT-001 is comprised of three wetland community types. The majority of the wetland is palustrine forested, consisting of tree and shrub species such as red maple, yellow birch, ironwood, slippery elm, and blueberry. These forested portions do not meet the vegetation criteria for potential bog turtle habitat. A second component of the wetland, that which is found along the ROW, is palustrine emergent. This portion consists of a *Phragmites* monoculture. Due to the density of this vegetation and lack of diversity, this portion of the wetland does not meet the vegetation criteria for potential bog turtle habitat. A third, smaller component of the wetland includes a palustrine scrub-shrub/emergent wetland just south of the ROW. The vegetation is composed of alder, silky dogwood, red maple, sphagnum moss, tussock sedge, skunk cabbage, sensitive fern, and cinnamon fern. The woody encroachment is slightly more than is preferable for bog turtle habitat, but there are enough breaks in the canopy to make this area marginally meet the vegetation criteria for potential bog turtle habitat. This wetland lies within the floodplain of the unnamed tributary to Haines Pond. In addition, groundwater seepage was evident in places, although no defined springs or subsurface channels (such as those preferred by bog turtles) were observed. Therefore, this wetland may marginally meet the hydrology criteria for potential bog turtle habitat. Throughout most of the forested and emergent portions of the wetland, the soils were firm. However in the scrub-shrub/emergent portion, there were areas of muck, some fairly deep. Therefore, at least in part, this wetland meets the soils criteria for potential bog turtle habitat.

Oxford Compressor Station

A Phase I Survey for bog turtle habitat was conducted on November 22, 2005 on the entire area of wetlands within the Oxford CS property. The property is undeveloped. It is primarily forested, with the exception of an existing natural gas pipeline ROW, and areas that had previously been cleared for agriculture and have now grown into a scrub-shrub community dominated by autumn olive. A stream called Eight Mile Brook traverses the western portion of the property, flowing north to south. A stream called Six Foot Wide Stream, which is a tributary to Eight Mile Brook, flows east to west through the northern portion of the site. An unnamed tributary to Six Foot Wide Stream is also present near the middle of the site. All of these

streams support several beaver dams that influence the hydrology of the wetlands on site. The majority of the site, and the wetlands, are forested. Those wetlands that are 100% forested are Wetlands A, D, E, and F. Dominant vegetation within these wetlands included red, white, and pin oaks, red maple, yellow birch, American elm, highbush blueberry, and spicebush. By the nature of the canopy closure and woody vegetation, these wetlands do not meet the vegetation criteria for potential bog turtle habitat. Wetlands B, C, and G are also primarily forested. They have wetter areas along stream corridors that also include winterberry and swamp azalea, in addition to the species mentioned above. Those portions that are forested also do not meet the vegetation criteria for bog turtle habitat. However, there are small areas of these wetlands that are emergent and/or scrub-shrub, which are discussed below.

Wetland B has an emergent edge along the border of Six Foot Wide Stream, which includes tussock sedge and woolgrass. In addition, Wetland B is crossed by the ROW in two places, which are dominated by vegetation including tussock sedge, woolgrass, cattail, soft-stem bulrush, tearthumb, and spatterdock. In these places, wetland B meets the vegetation criteria for potential bog turtle habitat. Wetland C is crossed by the ROW in one place, which is dominated by tussock sedge and woolgrass. In this place, wetland C meets the vegetation criteria for potential bog turtle habitat. Wetland G has one open emergent/scrub-shrub area along the edge of Eight Mile Brook, near the southwestern portion of the subject property. In this place, wetland G meets the vegetation criteria for potential bog turtle habitat.

No spring-fed hydrology was observed in any of the wetlands. Some wetlands may have a perched water table, indicating a minimal ground-water influence. Many of the wetlands are influenced by the presence of beaver dams along Six Foot Wide Stream, which has flooded the surrounding emergent and riparian areas. In particular, those emergent portions of Wetland B that are found within the ROW are too deeply inundated to support bog turtles. Wetland C had suitably shallow pockets of water, but no subterranean channels, seeps, or other evidence of groundwater hydrology. Therefore, based on these factors, none of the wetlands on the subject property meet the hydrology criteria for potential bog turtle habitat.

The only wetland that had the presence of mucky soils in some places was Wetland B. Therefore, portions of Wetland B would meet the soils criteria for potential bog turtle habitat. None of the other wetlands on the subject property had suitably soft, deep soils to provide potential bog turtle habitat. None of the seven wetlands on the subject property exhibited a combination of all three required criteria in order to be considered potential bog turtle habitat. In addition, only a very small percentage of the overall wetland complex was emergent or scrub-shrub, with the predominant wetland classification being palustrine forest, which in itself makes it unlikely that bog turtles would inhabit the smaller patches of open wetland. Therefore, no potential bog turtle habitat was found on the property.

Other factors to consider in making a determination for this site are geography and geology. In New England, the bog turtle is near the northern end of its distribution. Throughout other parts of the bog turtle's distribution, it has been documented as utilizing a wide range of wetland habitat types, which are underlain by a variety of bedrock types and associated with many different soils. By contrast, in New England and in Connecticut in particular, the habitat requirements for the bog turtle are quite specific. In Connecticut, the bog turtle occurs almost exclusively in or near calcareous wet meadows and fens that are usually bordered by shrub and red maple swamps (Klemens 1993). An important component of these areas is a continuous flow of groundwater seeping through the soil. This combination of geology and hydrology results in a unique plant community that includes species such as tamarack (*Larix laricina*), swamp birch (*Betula pumila*), fringed gentian (*Gentian crinata*) and various sedges (*Carex sp* .). As a result of these requirements, in Connecticut the bog turtle occurs in very limited areas, largely restricted to calcareous wetlands located to the west of the Housatonic River, and has been documented in only five towns. These towns include Salisbury, Sharon, Roxbury, Danbury, and Ridgefield (Klemens 1993). The Town of Oxford is located to the east of the Housatonic River and there are no calcareous wetlands on or adjacent to the site of the proposed CS. Based on these factors, along with the results of the habitat assessment itself, it is Algonquin's determination that

bog turtles do not inhabit the subject property. In correspondence dated January 11, 2006, the FWS concurred with Algonquin's findings at the Oxford CS site. The FERC staff agrees with this assessment.

Summary of Impact

Ramapo, New York Pipeline Replacement

Based on the marginal quality of the potential bog turtle habitat present in Wetlands 1 and 2, combined with the facts that these wetlands are generally surrounded by forest, and that bog turtles are considered to be extirpated from Rockland County, we believe that it is unlikely that bog turtles inhabit the Algonquin Ramapo Expansion Project proposed replacement corridor.

Stony Point Compressor Station

There is potential habitat for bog turtle located on the Stony Point CS site. However, no bog turtles are currently known to inhabit Rockland County, New York. In addition, no direct or indirect impacts to the potential habitat would occur as a result of the proposed construction at this site. Due to the presence of potential habitat, the FERC staff recommends that a herpetologist qualified by the FWS and NYSDEC to handle bog turtles be on-site throughout the duration of construction activities adjacent to the potential habitat. This herpetologist would serve as a bog turtle monitor. The bog turtle monitor would examine the CWA prior to the initiation of any construction activities adjacent to the wetland and would remove the bog turtles (or any other reptiles) found within the CWA to the adjacent suitable habitat. Silt fence would be installed along borders of the wetland prior to the initiation of any other construction activities to exclude access of turtles to the CWA. The bog turtle monitor would re-examine the CWA daily prior to the commencement of construction activities and would remove any bog turtles (or other reptiles) found within the CWA to the adjacent suitable habitat. All personnel performing construction activities would be trained to identify possible bog turtles and would immediately report any turtle within the CWA to the bog turtle monitor or environmental inspector. In the event of such a siting, all construction activities adjacent to the wetland would cease immediately until the turtle is removed to a safe place. In the event that a bog turtle is identified within the CWA or adjacent suitable habitat, the FWS and NYSDEC would be notified immediately.

Given that no direct or indirect impacts to the potential habitat would occur during construction, and that no bog turtles are currently known to inhabit Rockland County, and assuming that Algonquin complies with the above construction and mitigation procedures, the FERC staff believes that construction activities at the Stony Point CS would not affect the bog turtle.

Southeast Compressor Station

A small portion of the wetland complex located on the Southeast CS site marginally meets the criteria for potential bog turtle habitat. However, when the wetland is taken as a whole and viewed within the surrounding landscape, which is predominantly forested, it seems unlikely that bog turtles would inhabit this wetland. In addition, no direct or indirect impacts to the potential habitat would occur as a result of the proposed project. The construction workspace for the proposed facilities at the Southeast Compressor Station site would include 8.2 acres of developed land presently occupied in part by roadways, buildings, and maintained grassy areas, and an additional 4.1 acres of upland forest, of which 3.6 acres would be allowed to revert back to forest. No wetlands would be impacted during construction. Therefore, we believe that the bog turtle would not be impacted by Algonquin's activities at the Stony Point CS site.

Oxford Compressor Station

Construction of the Oxford Compressor Station would affect 0.09 acre of palustrine-forested wetland. This wetland is not considered to be suitable bog turtle habitat. Due to the fact that no potential bog turtle habitat occurs at the Oxford CS site, and that the bog turtle is largely restricted to calcareous wetlands in Connecticut, we believe that there would not be any impacts to the bog turtle at this site.

Determination of Effect

The FERC staff has determined that construction of the pipeline replacement portion of the proposed Algonquin Ramapo Expansion Project would not affect the bog turtle, based on the marginal habitat present. In addition, we have determined that construction activities at the Southeast and Oxford CS sites would not affect the bog turtle, due to lack of potential habitat. We further believe that with the implementation of the construction and mitigation measures proposed for the Stony Point CS site, the bog turtle would not be impacted at this site. In conclusion, we have determined that construction and operation of the Algonquin Ramapo Expansion portion of the NE-07 Project is unlikely to adversely impact the bog turtle.

Iroquois MarketAccess Project

Field Survey Methodology and Results

As part of the consultation for the Eastchester Extension Project, the FWS indicated to Iroquois that bog turtle habitat potentially occurs in the area of the Dover CS in Dover, NY. Iroquois surveyed the property in October 2001 to evaluate three on-site wetland areas. It was Iroquois' opinion that portions of one wetland (Wetland 1) located in the southeastern corner of the about 45-acre property by a powerline ROW may provide bog turtle habitat because it is dominated by herbaceous vegetation, has organic soils, and receives direct sunlight beneath the overhead power lines. While it is theoretically possible that bog turtles could utilize portions of this wetland, Iroquois concluded that it is not likely because of the habitats' small size and relative isolation from additional suitable habitat east of the Iroquois property along the Swamp River. Iroquois submitted a letter dated November 15, 2001 of its findings to the FWS and the Commission.

The FWS and FERC staff both accepted Iroquois' findings for the Eastchester Extension Project. The FWS responded in a letter dated January 2, 2002 for the ELIE Project that the proposed project would not be likely to affect the bog turtle. These conclusions are part of the public record in the FERC Certificate issued to Iroquois for the Eastchester Extension Project in Docket Number CP00-232. Iroquois' proposed MarketAccess Project includes construction activities at the Dover CS. These activities would be at least 300 feet away from the wetland previously identified as potential bog turtle habitat. In correspondence dated March 28, 2006 the FWS concurred that bog turtles are unlikely to occur within the proposed project area. Therefore, no additional surveys have been done.

Summary of Impact

Because of the small size of the potential bog turtle habitat and relative isolation from additional suitable habitat, we believe that construction activities at the Dover CS would not impact the bog turtle. In addition, construction activities would take place at least 300 feet from any potential bog turtle habitat; therefore, we believe that the Dover CS portion of the Iroquois MarketAccess Project is unlikely to affect bog turtle habitat.

Determination of Effect

Because of the marginal geographic characteristics of the potential bog turtle habitat at the Dover CS site, as well as the fact that construction would not impact the potential habitat, the FERC staff have determined that construction and operation of the Iroquois MarketAccess portion of the NE-07 Project is unlikely to adversely impact the bog turtle.

Overall Determination of Effect For the Bog Turtle

The FERC staff have concluded that construction and operation of the NE-07 Project would not likely adversely affect the bog turtle or any suitable habitat of the species, as long as Millennium and Algonquin implement the agreed-to construction and mitigation conditions for the Phase I and Ramapo Expansion portions of the NE-07 Project.

3.6 Leedy's Roseroot

Background

The Leedy's roseroot (*Sedum integrifolium* ssp. *leedyi*) was first listed on April 22, 1992. This perennial plant is endemic to western New York, where it occupies cliffside habitat along the shore of Seneca Lake, and also southeastern Minnesota where it occupies cool, maderate[2] cliffs. *Sedum integrifolium* ssp. *leedyi* is an isolated subspecies of a common western U.S. species. The range of *S. integrifolium* ssp. *leedyi* does not overlap the ranges of the three western subspecies (S. *integrifolium* ssp. *integrifolium, S. integrifolium* ssp. *neomexicanum,* and S. *integrifolium* ssp. *procera).* These western subspecies are found along the Western Cordillera from Alaska to California and Colorado (Clausen 1975). Leedy's roseroot has two dramatically disjunct centers of population, southeast Minnesota and western New York, a distributional pattern which suggests the subspecies is a relict of a Pleistocene flora that may have ranged across the continent before the last glaciation (Smith 1988). Seven populations from two states and a total of four counties are presently known.

Leedy's roseroot is threatened by its disjunct occurrences; its low numbers; off-site influences, such as groundwater contamination and hydrologic alterations; and direct on-site disturbances including erosion, rockslides, and staircase construction. Individual plants and habitat of the New York populations, which occur downhill from a number of lakeside homes, can be affected by clearing of vegetation on the cliffs and by pipes and staircases leading to the lakeshore (Sather 1993a). Potential indirect impacts from upslope agricultural activities and residential development are not well understood, but groundwater contamination can occur after fertilizers and pesticides are applied to nearby fields or lawns or after sinkholes are used as dump sites. Household and farm wastes, including pesticide containers, have been discarded in sinkholes near Minnesota sites (Refsnider 1988).

Leedy's roseroot is found only in very specialized cliffside habitats. The major New York population occurs on cliffs along the western shore of Seneca Lake. In Minnesota, populations occur on maderate cliffs, which are cooled by air exiting underground passages in the karst topography. Plants at Glenora Cliff, New York, are almost continuously distributed along 2 miles of the western shore of Seneca Lake. Plants occur on east-facing cliffs at elevations between 446 and 463 feet from near the tops of the cliffs to the talus. These lakeside cliffs are thinly bedded shale with intermittent thicker beds of siltstone. Drainage is good to poor, and most of the cliff face is dry. The largest concentration of Leedy's roseroot occurs in seepage areas, which may or may not remain moist throughout the year. In sheltered areas behind boathouses, plants occur on the talus itself.

Associated species include the state rare Whitlow grass, as well as herb-Robert (*Geranium robertianum*), pellitory (*Parietaria pensylvanica*), Virginia creeper (*Parthenocissus inserta*), Canada bluegrass (*Poa compressa*), and poison ivy (*Toxicodendron radicans*) (Clausen 1975, TNC 1985-1991a). The weedy nonnative Japanese knotweed (*Polygonum cuspidatum*) exhibits abundant growth on talus throughout

2 A maderate cliff is a talus slope that has lost the talus layer from erosion to form a cliff face. The small underground cracks that feed cold air are then exposed on the surface of the cliff creating a cold moist habitat.

the northern half of the site, obscuring both Leedy's roseroot and the cliff face (TNC 1985-1991a). Plants at Glenora Falls occur on the east and south-facing cliff faces just north of a waterfall. The plants themselves occur on a wet, seepy cliff face with a talus slope below. Bulblet fern, Virginia creeper and pale touch-me-not are common on the talus slope, with hemlock (*Tsuga Canadensis*) on the top of the cliff (NYNHP 1996). The single Leedy's roseroot plant still found at Watkins Glen, New York, occurs near the top of a disintegrating shale slope in a developed area near the open, sunny mouth of a narrow, shaded gorge. Elevation of the site is 157 m (515 ft), exposure is southern, and drainage is poor (Clausen 1975). Dominant canopy trees are maple and hemlock.

Empire Connector Project

Field Survey Methodology and Results

The Leedy's roseroot occurs along the face of shale cliffs along Seneca Lake in New York State. According to FWS correspondence (October 26, 2004), the plants are located about two miles from Empire's proposed project site. The project site does not contain any cliff faces or other suitable habitat for Leedy's roseroot, and the project would not impact any cliffs or Cliffside vegetation. Therefore, because of the lack of suitable habitat at the project site, Empire did not survey for the species.

Summary of Impact

Because no cliff areas have been observed at Empire's project facilities and no disturbance of cliff vegetation would occur, we believe that the Empire Connector Project would not impact Leedy's roseroot.

Determination of Effect

Due to the lack of potential habitat along the project facilities, the FERC staff has determined that Empire's Connector Project is not likely to affect the Leedy's roseroot.

Overall Determination of Effect for the Leedy's Roseroot

The FERC staff have concluded that construction and operation of the NE-07 Project would not affect the Leedy's roseroot or any suitable habitat of the species.

4.0 CONCLUSIONS

Six federally listed endangered or threatened species were considered by the FERC as potentially occurring in the vicinity of the proposed NE-07 Project facilities. Based on our analysis in this BA, the FERC staff has determined that, with implementation of each pipeline company's (Millennium, Columbia, Empire, Algonquin, and Iroquois) proposed compensation measures, our recommended compensation measures, and their ECS (which incorporates our Plan and Procedures), the project would result in no adverse effect on five species (shortnose sturgeon, dwarf wedge mussel, bald eagle, bog turtle, and Leedy's roseroot). The FERC staff has determined that the Millennium Phase I Project may affect, but is not likely to adversely affect, the Indiana bat. The Empire Connector and Iroquois MarketAccess components of the NE-07 Project are unlikely to adversely affect the Indiana bat. However, Algonquin has not completed surveys for the Indian bat in the Ramapo Expansion area of the NE-07 Project. Therefore, we are unable to make an overall determination of effect for the Indiana bat at this time. We expect a biological opinion to be issued from the FWS and NMFS in response to this BA and Algonquin's completed surveys for the Indiana bat.

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New York State Department of Environmental Conservation. 1998c. Letter dated July 24, between P. Nye (Research Scientist, Endangered Species Unit) and L. Shumway (Environmental Project Manager, Millennium).

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U.S. Department of the Interior, Fish and Wildlife Service. 2000b. Letter dated April 28, from D. Stilwell (Field Supervisor, FWS) to M. Feierstein (District Engineer, COE).

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APPENDIX A

INFORMAL CONSULTATION COMMUNICATIONS

National Marine Fisheries Service

Millennium

December 18, 1997	Letter to L. Shumway (Millennium) from D. Rusanowsky (NMFS).
April 23, 1998	Telephone conversation between D. Rusanowsky (NMFS) and L. Shumway (Millennium).
February 2, 1999	Letter to D. Rusanowsky (NMFS) from L. Shumway (Millennium).
February 5, 1999	Letter to D. Rusanowsky (NMFS) from L. Shumway (Millennium).
February 17, 1999	Fax to L. Shumway (Millennium) from D. Rusanowsky (NMFS).
February 24, 1999	Telephone conversation between D. Rusanowsky and N. Haley (NMFS) and J. Goggin, J. Shenot, J. Martin, and J. Wachholder (FERC), and P. Patterson (FERC staff third-party environmental contractor).
March 2, 1999	Letter to D. Rusanowsky (NMFS) from L. Shumway (Millennium).
September 17, 1999	Telephone conversation between D. Rusanowsky (NMFS) and J. Shenot (FERC).
September 23, 1999	E-mail from D. Rusanowsky (NMFS) to J. Shenot (FERC)
December 17, 1999	Letter to D. Rusanowsky (NMFS) from K. Madden (FERC).
March 10, 2000	Letter to K. Madden (FERC) from S. Gorski (NMFS, Highlands, New Jersey)
April 20, 2000	Letter to D. Boergers (FERC) from A. Kemmerer (NMFS).
May 2, 2000	Letter to Lt. Colonel Mark D. Feierstein (COE) from P. Kurkul (NMFS, Gloucester, Massachusetts).

U.S. Fish and Wildlife Service

Millennium

July 17, 1997	Letter to L. Shumway (Millennium) from S. Morgan (FWS).
November 12, 1997	Letter to S. Morgan (FWS) from L. Shumway (Millennium).
December 12, 1997	Letter to L. Shumway (Millennium) from S. Morgan (FWS).
March 27, 1998	Letter to D. Boergers (FERC) from S. Morgan (FWS).

April 22, 1998	Telephone conversation between M. Stoll (FWS) and L. Shumway (Millennium).
July 16, 1998	FAX to M. Stoll (FWS) from L. Shumway (Millennium).
February 3, 1999	Letter to L. Shumway (Millennium) from D. Stilwell (FWS, Cortland, New York).
February 5, 1999	Letter to S. Morgan (FWS) from L. Shumway (Millennium).
February 19, 1999	Telephone conversation between D. Mann-Klager (FWS) and L. Shumway (Millennium).
February 26, 1999	Letter to D. Stilwell (FWS) from L. Shumway (Millennium).
March 4, 1999	Letter to D. Mann-Klager (FWS) from L. Shumway (Millennium).
June 4, 1999	Letter to D. Boergers (FERC) from D. Stilwell (FWS).
August 17, 1999	Letter to D. Boergers (FERC) from D. Stilwell (FWS).
October 26, 1999	Telephone conversation between D. Mann-Klager (FWS) and J. Shenot and J. Wachholder (FERC).
April 21, 2000	Letter to D. Boergers (FERC) from D. Stilwell (FWS).
April 28, 2000	Letter to Lt. Colonel M. Feierstein (COE) from D. Stilwell (FWS).
August 10, 2004	Letter to D. Stilwell (FWS, Cortland, NY) from J. Wachter (Millennium).
October 6, 2004	Letter to D. Stilwell (FWS, Cortland, NY) from G. Reese (Millennium).
December 7, 2004	Letter to G. Reese (Millennium) from D. Stilwell (FWS, Cortland, NY).
January 4, 2005	Letter to M. Salas (FERC) from D. Stilwell (FWS, Cortland, NY).
February 23, 2005	Letter to J. Wachter (Millennium) from D. Stilwell (FWS, Cortland, NY).
March 7, 2005	Letter to M. Salas (FERC) from D. Stilwell (FWS, Cortland, NY).
April 7, 2005	Letter to D. Stilwell (FWS, Cortland, NY) from J. Wachter (Millennium).
June 9, 2005	Letter to J. Wachter (Millennium) from D. Stilwell (FWS, Cortland, NY).
March 9, 2006	Letter to R. Niver (FWS, Cortland, NY) from R. Hall (Millennium).
<u>Empire</u>	
October 26, 2004	Letter to M. Salas (FERC) from D. Stilwell (FWS, Cortland, NY).

June 16, 2004	Letter to N. Conrad (NYNHP) from S. Compton (Empire).
June 16, 2004	Email to N. Conrad (NYNHP) from S. Lare (Empire).
June 30, 2004	Letter to S. Lare (Empire) from N. Conrad (NYNHP).
June 30, 2004	Email to S. Lare (Empire) from N. Conrad (NYNHP).
January 31, 2005	Letter to M. Salas (FERC) from D. Stilwell (FWS).
March 14, 2005	Letter to M. Salas (FERC) from D. Stilwell (FWS).
April 5, 2005	Letter to M. Salas (FERC) from V. Dick (Empire).

Algonquin

September 16, 2005	Letter to M. Stoll (FWS, Cortland, NY) from J. Durand (Algonquin).
September 19, 2005	Letter to M. Amaral (FWS, Concord, NH) from J. Durand (Algonquin).
October 20, 2005	Letter to J. Durand (Algonquin) from M. Amaral (FWS, Concord, NH).
October 21, 2005	Letter to J. Durand (Algonquin) from D. Stilwell (FWS, Cortland, NY).
October 26, 2005	Letter to M. Stoll (FWS, Cortland, NY) from J. Durand (Algonquin).
November 30, 2005	Letter to C. Day (FWS, Pleasantville, NJ) from J. Durand (Algonquin).
December 16, 2005	Letter to J. Durand (Algonquin) from J. Staples (FWS, Pleasantville, NJ).
December 19, 2005	Letter to M. Clough (FWS, Cortland, NY) from T. O'Sullivan (Algonquin).
December 19, 2005	Letter to A. Tur (FWS, Concord, NH) from T. O'Sullivan (Algonquin).
December 22, 2005	Letter to M. Amaral (FWS, Concord, NH) from J. Durand (Algonquin).
January 11, 2006	Letter to T. O'Sullivan (Algonquin) from M. Amaral (FWS, Concord, NH).
January 26, 2006	Letter to J. Durand (Algonquin) from M. Amaral (FWS, Concord, NH).
January 27, 2006	Letter to M. Stoll (FWS, Cortland, NY) from T. O'Sullivan (Algonquin).
February 14, 2006	Letter to C. Day (FWS, Pleasantville, NJ) from T. O'Sullivan (Algonquin).

Iroquois

June 19, 2001	Letter to S. Von Oettingen (FWS, Concord, NH) from M. Gardella (Iroquois).

June 19, 2001	Letter to M. Gardella (Iroquois) from M. Amaral (FWS, Concord, NH).
August 27, 2001	Letter to S. Sinkeviech (FWS, Islip, NY) from P. London (Iroquois).
September 27, 2001	Letter to P. London (Iroquois) from D. Stilwell (FWS, Cortland, NY).
November 15, 2001	Letter to D. Stillwell (FWS, Cortland, NY) from T. O'Sullivan (Iroquois).
January 2, 2002	Letter to T. O'Sullivan (Iroquois) from D. Stilwell (FWS, Cortland, NY).
November 17, 2005	Telephone conversation between A. Secord (FWS, Cortland, NY) and P. London (Iroquois).
December 8, 2005	Letter to M. Amaral (FWS, Concord, NH) from P. London (Iroquois).
December 8, 2005	Letter to A. Secord (FWS, Cortland, NY) from P. London (Iroquois).
January 11, 2006	Letter to P. London (Iroquois) from M. Amaral (FWS, Concord, NH).
February 3, 2006	Letter to P. London (Iroquois) from D. Stilwell (FWS, Cortland, NY).
February 8, 2006	Letter to M. Salas (FERC) from D. Stilwell (FWS, Cortland, NY).
February 14, 2006	Letter to M. Amaral (FWS, Concord, NH) from P. London (Iroquois).
February 21, 2006	Letter to M. Secord (FWS, Cortland, NY) from P. London (Iroquois).
March 15, 2006	Letter to P. London (Iroquois) from M. Amaral (FWS, Concord, NH).
March 22, 2006	Telephone conversation between R. Niver (FWS, Cortland, NY) and P. London (Iroquois).
March 28, 2006	Letter to P. London (Iroquois) from D. Stilwell (FWS, Cortland, NY).

New York State Department of Environmental Conservation and Natural Heritage Program

Millennium

September 8, 1997	Letter to L. Shumway (Millennium) from N. Conrad (NYNHP).
December 22, 1997	Letter to L. Shumway (Millennium) from N. Conrad (NYNHP).
June 22, 1998	Telephone conversation between M. Kallaji (NYSDEC) and LJE (GAI, consultants to Millennium).
July 1, 1998	Telephone conversation between P. Nye (NYSDEC, Delmar, New York) and LJE (GAI, consultants to Millennium).
July 24, 1998	Letter to L. Shumway (Millennium) from P. Nye (NYSDEC).

February 2, 1999	Letter to N. Conrad (NYNHP) from L. Shumway (Millennium).
February 17, 1999	Letter to L. Shumway (Millennium) from K. Seleen (NYNHP).
September 14, 2004	Letter to J. Wachter (Millennium) from C. Houle (NYNHP).
March 9, 2006	Letter to R. Niver (FWS, Cortland, NY) from R. Hall (Millennium).
May 16, 2005	Meeting between Millennium and FWS.
July 21, 2005	Field meeting between Millennium and FWS.
November 30, 2005	Meeting between Millennium and FWS.
March 9, 2006	Letter to J. Gregg (NYSDEC) from R. Hall (Millennium).
Empire	
February 16, 2005	Letter to M. Salas (FERC) from (NYSDEC).
March 16, 2005	Letter to M. Salas (FERC) from V. Dick (Empire).
March 14, 2006	Letter to M. Salas (FERC) from N. Conrad (NYNHP).
Algonquin	
September 16, 2005	Letter to J. Pietrusiak (NYNHP) from J. Durand (Algonquin).
October 26, 2005	Letter to J. Pietrusiak (NYNHP) from J. Durand (Algonquin).
November 2, 2005	Letter to J. Durand (Algonquin) from C. Houle (NYNHP).
December 7, 2005	Letter to J. Durand (Algonquin) from C. Houle (NYNHP).
February 14, 2006	Letter to S. Joule (NYSDEC) from T. O'Sullivan (Algonquin).
Iroquois	
August 27, 2001	Letter to N. Conrad (NYNHP) from P. London (Iroquois).
October 4, 2001	Letter to P. London (Iroquois) from B. Ketcham (NYNHP).
December 8, 2005	Letter to J. Pietrusiak (NYNHP) from P. London (Iroquois).
January 24, 2006	Letter to P. London (Iroquois) from B. Ketcham (NYNHP).
February 23, 2006	Telephone conversation between P. London (Iroquois) and S. Joule (NYSDEC).

February 28, 2006 Letter to K. Draghi (Iroquois) from P. London (Iroquois).

March 3, 2006 Letter to S. Joule (NYSDEC) from K. Draghi (Iroquois).

March 3, 2006 Letter to P. London (Iroquois) from S. Innes (NYSDEC).

New York State Department of State

Millennium

December 20, 1999 Letter to K. Madden (FERC) from S. Resler (NYSDOS).

April 7, 2000 Letter to D. Boergers (FERC) from G. Stafford (NYSDOS).

Algonquin

September 19, 2005 Letter to D. McKay (CTDEP) from S. Resler (NYSDOS).

The Nature Conservancy

Millennium

December 1, 1998 Letter to D. Boergers (FERC) from G. Shuler (TNC, Cuddebackville, New York).

February 5, 1999 Letter to G. Schuler (TNC, Cuddebackville, New York) from L. Shumway (Millennium).

Connecticut Department of Environmental Protection

Algonquin

September 19, 2005 Letter to D. McKay (CTDEP) from J. Durand (Algonquin).

October 12, 2005 Letter to J. Durand (Algonquin) from D. McKay (CTDEP).

December 22, 2005 Letter to D. McKay (CTDEP) from J. Durand (Algonquin).

December 30, 2005 Letter to J. Durand (Algonquin) from N. Murray (CTDEP).

Iroquois

June 19, 2001 Letter to D. McKay (CTDEP) from M. Gardella (Algonquin).

July 3, 2001 Letter to M. Gardella (Algonquin) from D. McKay (CTDEP).

December 8, 2005 Letter to D. McKay (CTDEP) from P. London (Algonquin).

December 29, 2005 Letter to P. London (Algonquin) from K. Metzler (CTDEP).

February 14, 2006 Letter to D. McKay (CTDEP) from P. London (Algonquin).

New Jersey Department of Environmental Protection

Algonquin

November 30, 2005 Letter to H. Lord (NJDEP) from J. Durand (Algonquin).

December 7, 2005 Letter to J. Durand (Algonquin) from H. Lord (NJDEP).

APPENDIX B

FERC PLAN AND PROCEDURES

UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN

01/17/2003 VERSION

UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN

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UPLAND EROSION CONTROL, REVEGETATION, AND MAINTENANCE PLAN (PLAN)

I. APPLICABILITY

A. The intent of this Plan is to assist applicants by identifying baseline mitigation measures for minimizing erosion and enhancing revegetation. The project sponsors should specify in their applications for a FERC Certificate (Certificate) any individual measures in this Plan they consider unnecessary, technically infeasible, or unsuitable due to local conditions and to fully describe any alternative measures they would use. Applicants should also explain how those alternative measures would achieve a comparable level of mitigation.

Once a project is certificated, further changes can be approved. Any such changes from the measures in this Plan (or the applicant's approved plan) will be approved by the Director of the Office of Energy Projects (Director), upon the applicant's written request, if the Director agrees that an alternative measure:

1. provides equal or better environmental protection;

2. is necessary because a portion of this Plan is infeasible or unworkable based on project-specific conditions; or

3. is specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Any requirements in this Plan to file material with the Secretary of the FERC (Secretary) do not apply to projects undertaken under the provisions of the blanket certificate program. This exemption does not apply to a request for alternative measures.

Project-related impacts on wetland and waterbody systems are addressed in the staff's Wetland and Waterbody Construction and Mitigation Procedures (Procedures).

II. SUPERVISION AND INSPECTION

A. ENVIRONMENTAL INSPECTION

1. At least one Environmental Inspector is required for each construction spread during construction and restoration (as defined by section V). The number and experience of Environmental Inspectors assigned to each construction spread should be appropriate for the length of the construction spread and the number/significance of resources affected.

2. Environmental Inspectors shall have peer status with all other activity inspectors.

3. Environmental Inspectors shall have the authority to stop activities that violate the environmental conditions of the Certificate, state and Federal environmental permit conditions, or landowner requirements; and to order appropriate corrective action.

B. RESPONSIBILITIES OF ENVIRONMENTAL INSPECTORS

At a minimum, the Environmental Inspector(s) shall be responsible for:

1. Ensuring compliance with the requirements of this Plan, the Procedures, the environmental conditions of the Certificate authorization, the mitigation measures proposed by the applicant (as approved and/or modified by the Certificate), other environmental permits and approvals, and environmental requirements in landowner easement agreements;

2. Identifying, documenting, and overseeing corrective actions, as necessary to bring an activity back into compliance;

3. Verifying that the limits of authorized construction work areas and locations of access roads are properly marked before clearing;

4. Verifying the location of signs and highly visible flagging marking the boundaries of sensitive resource areas, waterbodies, wetlands, or areas with special requirements along the construction work area;

5. Identifying erosion/sediment control and soil stabilization needs in all areas;

6. Ensuring that the location of dewatering structures and slope breakers will not direct water into known cultural resources sites or locations of sensitive species;

7. Verifying that trench dewatering activities do not result in the deposition of sand, silt, and/or sediment near the point of discharge into a wetland or waterbody. If such deposition is occurring, the dewatering activity shall be stopped and the design of the discharge shall be changed to prevent reoccurrence;

8. Ensuring that subsoil and topsoil are tested in agricultural and residential areas to measure compaction and determine the need for corrective action;

9. Advising the Chief Construction Inspector when conditions (such as wet weather) make it advisable to restrict construction activities to avoid excessive rutting;

10. Ensuring restoration of contours and topsoil;

11. Verifying that the soils imported for agricultural or residential use have been certified as free of noxious weeds and soil pests, unless otherwise approved by the landowner;

12. Determining the need for and ensuring that erosion controls are properly installed, as necessary to prevent sediment flow into wetlands, waterbodies, sensitive areas, and onto roads;

13. Inspecting and ensuring the maintenance of temporary erosion control measures at least:

    a. on a daily basis in areas of active construction or equipment operation;

    b. on a weekly basis in areas with no construction or equipment operation; and

    c. within 24 hours of each 0.5 inch of rainfall;

14. Ensuring the repair of all ineffective temporary erosion control measures within 24 hours of identification;

15. Keeping records of compliance with the environmental conditions of the FERC certificate, and the mitigation measures proposed by the project sponsor in the application submitted to the FERC, and other Federal or state environmental permits during active construction and restoration; and

16. Identifying areas that should be given special attention to ensure stabilization and restoration after the construction phase.

III. PRECONSTRUCTION PLANNING

The project sponsor shall do the following before construction:

A. CONSTRUCTION WORK AREAS

1. Identify all construction work areas (e.g., construction right-of-way, extra work space areas, pipe storage and contractor yards, borrow and disposal areas, access roads, etc.) that would be needed for safe construction. The project sponsor must ensure that appropriate cultural resources and biological surveys have been conducted.

2. Project sponsors are encouraged to consider expanding any required cultural resources and endangered species surveys in anticipation of the need for activities outside of certificated work areas.

B. DRAIN TILE AND IRRIGATION SYSTEMS

1. Attempt to locate existing drain tiles and irrigation systems.

2. Contact landowners and local soil conservation authorities to determine the locations of future drain tiles that are likely to be installed within 3 years of the authorized construction.

3. Develop procedures for constructing through drain-tiled areas, maintaining irrigation systems during construction, and repairing drain tiles and irrigation systems after construction.

4. Engage qualified drain tile specialists, as needed to conduct or monitor repairs to drain tile systems affected by construction. Use drain tile specialists from the project area, if available.

C. GRAZING DEFERMENT

Develop grazing deferment plans with willing landowners, grazing permittees, and land management agencies to minimize grazing disturbance of revegetation efforts.

D. ROAD CROSSINGS AND ACCESS POINTS

Plan for safe and accessible conditions at all roadway crossings and access points during construction and restoration.

E. DISPOSAL PLANNING

Determine methods and locations for the disposal of construction debris (e.g., timber, slash, mats, garbage, drilling fluids, excess rock, etc). Off-site disposal in other than commercially operated disposal locations is subject to compliance with all applicable survey, landowner permission, and mitigation requirements.

F. AGENCY COORDINATION

The project sponsor must coordinate with the appropriate local, state, and Federal agencies as outlined in this Plan and in the Certificate.

1. Obtain written recommendations from the local soil conservation authorities or land management agencies regarding permanent erosion control and revegetation specifications.

2. Develop specific procedures in coordination with the appropriate agency to prevent the introduction or spread of noxious weeds and soil pests resulting from construction and restoration activities.

G. STORMWATER POLLUTION PREVENTION PLAN

Make available on each construction spread the Stormwater Pollution Prevention Plan prepared for compliance with the U.S. Environmental Protection Agency's National Stormwater Program General Permit requirements.

IV. INSTALLATION

A. APPROVED AREAS OF DISTURBANCE

1. Project-related ground disturbance shall be limited to the construction right-of-way, extra work space areas, pipe storage yards, borrow and disposal areas, access roads, and other areas approved in the Certificate. Any project-related ground disturbing activities outside these Certificated areas, except those needed to comply with the Plan and Procedures (e.g., slope breakers, energy-dissipating devices, dewatering structures, drain tile system repairs) will require prior Director approval. All construction or restoration activities outside of the Certificated areas are subject to all applicable survey and mitigation requirements.

2. The construction right-of-way width for a project shall not exceed 75 feet or that described in the FERC application unless otherwise modified by a Certificate condition. However, in limited, non-wetland areas, this construction right-of-way width may be expanded by up to 25 feet without Director approval to accommodate full construction right-of-way topsoil segregation and to ensure safe construction where topographic conditions (such as side-slopes) or soil limitations require it. Twenty-five feet of extra construction right-of-way width may also be used in limited, non-wetland or non-forested areas for truck turn-arounds where no reasonable alternative access exists.

   Project use of these additional limited areas is subject to landowner approval and compliance with all applicable survey and mitigation requirements. When such additional areas are used, each one should be identified and the need explained in the weekly or biweekly construction reports to the FERC, if required. The following material should be included in the reports:

   a. the location of each additional area by station number and reference to a previously filed alignment sheet, or updated alignment sheets showing the additional areas;

   b. identification of where the Commission's records contain evidence that the additional areas were previously surveyed; and

c. a statement that landowner approval has been obtained and is available in project files.

Prior written approval of the Director is required when the Certificated construction right-of-way width would be expanded by more than 25 feet.

B. TOPSOIL SEGREGATION

1. Unless the landowner or land management agency specifically approves otherwise, prevent the mixing of topsoil with subsoil by stripping topsoil from either the full work area or from the trench and subsoil storage area (ditch plus spoil side method) in:

   a. actively cultivated or rotated croplands and pastures;

   b. residential areas;

   c. hayfields; and

   d. other areas at the landowner's or land managing agency’s request.

2. In residential areas importation of topsoil is an acceptable alternative to topsoil segregation.

3. In deep soils (more than 12 inches of topsoil), segregate at least 12 inches of topsoil. In soils with less than 12 inches of topsoil make every effort to segregate the entire topsoil layer.

4. Where topsoil segregation is required, maintain separation of salvaged topsoil and subsoil throughout all construction activities.

5. Segregated topsoil may not be used for padding the pipe.

C. DRAIN TILES

1. Mark locations of drain tiles damaged during construction.

2. Probe all drainage tile systems within the area of disturbance to check for damage.

3. Repair damaged drain tiles to their original or better condition. Do not use filter-covered drain tiles unless the local soil conservation authorities and the landowner agree. Use qualified specialists for testing and repairs.

4. For new pipelines in areas where drain tiles exist or are planned, ensure that the depth of cover over the pipeline is sufficient to avoid interference with drain tile systems. For adjacent pipeline loops in agricultural areas, install the new pipeline with at least the same depth of cover as the existing pipeline(s).

D. IRRIGATION

Maintain water flow in crop irrigation systems, unless shutoff is coordinated with affected parties.

E. ROAD CROSSINGS AND ACCESS POINTS

1. Maintain safe and accessible conditions at all road crossings and access points during construction.

2. If crushed stone access pads are used in residential or active agricultural areas, place the stone on synthetic fabric to facilitate removal.

F. TEMPORARY EROSION CONTROL

Install temporary erosion controls immediately after initial disturbance of the soil. Temporary erosion controls must be properly maintained throughout construction (on a daily basis) and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration is complete.

1. Temporary Slope Breakers

a. Temporary slope breakers are intended to reduce runoff velocity and divert water off the construction right-of-way. Temporary slope breakers may be constructed of materials such as soil, silt fence, staked hay or straw bales, or sand bags.

b. Install temporary slope breakers on all disturbed areas, as necessary to avoid excessive erosion. Temporary slope breakers must be installed on slopes greater than 5 percent where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings at the following spacing (closer spacing should be used if necessary):

Slope (%)	Spacing (feet)
5 - 15	300
>15 - 30	200
>30	100

c. Direct the outfall of each temporary slope breaker to a stable, well vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way.

d. Position the outfall of each temporary slope breaker to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources.

2. Sediment Barriers

a. Sediment barriers are intended to stop the flow of sediments and to prevent the deposition of sediments into sensitive resources. They may be constructed of materials such as silt fence, staked hay or straw bales, compacted earth (e.g., driveable berms across travelways), sand bags, or other appropriate materials.

b. At a minimum, install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody, wetland, or road crossing until revegetation is successful as defined in this Plan. Leave adequate room between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.

c. Where wetlands or waterbodies are adjacent to and downslope of construction work areas, install sediment barriers along the edge of these areas, as necessary to prevent sediment flow into the wetland or waterbody.

3. Mulch

a. Apply mulch on all slopes (except in actively cultivated cropland) concurrent with or immediately after seeding, where necessary to stabilize the soil surface and to reduce wind and water erosion. Spread mulch uniformly over the area to cover at least 75 percent of the ground surface at a rate of 2 tons/acre of straw or its equivalent, unless the local soil conservation authority, landowner, or land managing agency approves otherwise in writing.

b. Mulch can consist of weed-free straw or hay, wood fiber hydromulch, erosion control fabric, or some functional equivalent.

c. Mulch before seeding if:

(1) final grading and installation of permanent erosion control measures will not be completed in an area within 20 days after the trench in that area is backfilled (10 days in residential areas), as required in section V.A.1; or

(2) construction or restoration activity is interrupted for extended periods, such as when seeding cannot be completed due to seeding period restrictions.

d. If mulching before seeding, increase mulch application on all slopes within 100 feet of waterbodies and wetlands to a rate of 3 tons/acre of straw or equivalent.

e. If wood chips are used as mulch, do not use more than 1 ton/acre and add the equivalent of 11 lbs/acre available nitrogen (at least 50 percent of which is slow release).

f. Ensure that mulch is adequately anchored to minimize loss due to wind and water.

g. When anchoring with liquid mulch binders, use rates recommended by the manufacturer. Do not use liquid mulch binders within 100 feet of wetlands or waterbodies.

h. Install erosion control fabric on waterbody banks at the time of final bank recontouring. Anchor the erosion control fabric with staples or other appropriate devices.

V. RESTORATION

A. CLEANUP

1. Commence cleanup operations immediately following backfill operations. Complete final grading, topsoil replacement, and installation of permanent erosion control structures within 20 days after backfilling the trench (10 days in residential areas). If seasonal or other weather conditions prevent compliance with these time frames, maintain temporary erosion controls (temporary slope breakers and sediment barriers) until conditions allow completion of cleanup.

   The project sponsor should file with the Secretary for the review and written approval of the Director, a winterization plan if construction will continue into the winter season when conditions could delay successful decompaction, topsoil replacement, or seeding until the following spring.

2. A travel lane may be left open temporarily to allow access by construction traffic if the temporary erosion control structures are installed (as specified in section IV.F.) and inspected and maintained (as specified in sections II.B.12 through 14). When access is no longer required, the travel lane must be removed and the right-of-way restored.

3. Rock excavated from the trench may be used to backfill the trench only to the top of the existing bedrock profile. Rock that is not returned to the trench should be considered construction debris, unless approved for use as mulch or for some other use on the construction work areas by the landowner or land managing agency.

4. Remove excess rock from at least the top 12 inches of soil in all actively cultivated or rotated cropland and pastures, hayfields, and residential areas, as well as other areas at the landowner's request. The size, density, and distribution of rock on the construction work area should be similar to adjacent areas not disturbed by construction. The landowner may approve other provisions in writing.

5. Grade the construction right-of-way to restore pre-construction contours and leave the soil in the proper condition for planting.

6. Remove construction debris from all construction work areas unless the landowner or land managing agency approves otherwise.

7. Remove temporary sediment barriers when replaced by permanent erosion control measures or when revegetation is successful.

B. PERMANENT EROSION CONTROL DEVICES

1. Trench Breakers

a. Trench breakers are intended to slow the flow of subsurface water along the trench. Trench breakers may be constructed of materials such as sand bags or polyurethane foam. Do not use topsoil in trench breakers.

b. An engineer or similarly qualified professional shall determine the need for and spacing of trench breakers. Otherwise, trench breakers shall be installed at the same spacing as and upslope of permanent slope breakers.

c. In agricultural fields and residential areas where slope breakers are not typically required, install trench breakers at the same spacing as if permanent slope breakers were required.

d. At a minimum, install a trench breaker at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland.

2. Permanent Slope Breakers

a. Permanent slope breakers are intended to reduce runoff velocity, divert water off the construction right-of-way, and prevent sediment deposition into sensitive resources. Permanent slope breakers may be constructed of materials such as soil, sand bags, or some functional equivalent.

b. Construct and maintain permanent slope breakers in all areas, except cultivated areas and lawns, using spacing recommendations obtained from the local soil conservation authority or land managing agency.

In the absence of written recommendations, use the following spacing unless closer spacing is necessary to avoid excessive erosion on the construction right-of-way:

Slope (%)	Spacing (feet)
5 - 15	300
>15 - 30	200
>30	100

c. Construct slope breakers to divert surface flow to a stable area without causing water to pool or erode behind the breaker. In the absence of a stable area, construct appropriate energy-dissipating devices at the end of the breaker.

d. Slope breakers may extend slightly (about 4 feet) beyond the edge of the construction right-of-way to effectively drain water off the disturbed area. Where slope breakers extend beyond the edge of the construction right-of-way, they are subject to compliance with all applicable survey requirements.

C. SOIL COMPACTION MITIGATION

1. Test topsoil and subsoil for compaction at regular intervals in agricultural and residential areas disturbed by construction activities. Conduct tests on the same soil type under similar moisture conditions in undisturbed areas to approximate preconstruction conditions. Use penetrometers or other appropriate devices to conduct tests.

2. Plow severely compacted agricultural areas with a paraplow or other deep tillage implement. In areas where topsoil has been segregated, plow the subsoil before replacing the segregated topsoil.

   Alternatively, make arrangements with the landowner to plant and plow under a "green manure" crop, such as alfalfa, to decrease soil bulk density and improve soil structure. If subsequent construction and cleanup activities result in further compaction, conduct additional tilling.

3. Perform appropriate soil compaction mitigation in severely compacted residential areas.

D. REVEGETATION

1. General

   a. The project sponsor is responsible for ensuring successful revegetation of soils disturbed by project-related activities, except as noted in section V.D.1.b.

   b. Restore all turf, ornamental shrubs, and specialized landscaping in accordance with the landowner's request, or compensate the landowner. Restoration work must be performed by personnel familiar with local horticultural and turf establishment practices.

2. Soil Additives

   Fertilize and add soil pH modifiers in accordance with written recommendations obtained from the local soil conservation authority, land management agencies, or landowner. Incorporate recommended soil pH modifier and fertilizer into the top 2 inches of soil as soon as possible after application.

3. Seeding Requirements

   a. Prepare a seedbed in disturbed areas to a depth of 3 to 4 inches using appropriate equipment to provide a firm seedbed. When hydroseeding, scarify the seedbed to facilitate lodging and germination of seed.

b. Seed disturbed areas in accordance with written recommendations for seed mixes, rates, and dates obtained from the local soil conservation authority or as requested by the landowner or land management agency. Seeding is not required in actively cultivated croplands unless requested by the landowner.

c. Perform seeding of permanent vegetation within the recommended seeding dates. If seeding cannot be done within those dates, use appropriate temporary erosion control measures discussed in section IV.F. and perform seeding of permanent vegetation at the beginning of the next recommended seeding season. Lawns may be seeded on a schedule established with the landowner.

d. In the absence of written recommendations from the local soil conservation authorities, seed all disturbed soils within 6 working days of final grading, weather and soil conditions permitting, subject to the specifications in section V.D.3.a-c.

e. Base seeding rates on Pure Live Seed. Use seed within 12 months of seed testing.

f. Treat legume seed with an inoculant specific to the species using the manufacturer’s recommended rate of inoculant appropriate for the seeding method (broadcast, drill, or hydro).

g. In the absence of written recommendations from the local soil conservation authorities, landowner, or land managing agency to the contrary, a seed drill equipped with a cultipacker is preferred for seed application.

   Broadcast or hydroseeding can be used in lieu of drilling at double the recommended seeding rates. Where seed is broadcast, firm the seedbed with a cultipacker or imprinter after seeding. In rocky soils or where site conditions may limit the effectiveness of this equipment, other alternatives may be appropriate (e.g., use of a chain drag) to lightly cover seed after application, as approved by the Environmental Inspector.

VI. OFF-ROAD VEHICLE CONTROL

To each owner or manager of forested lands offer to install and maintain measures to control unauthorized vehicle access to the right-of-way. These measures may include:

A. Signs;

B. Fences with locking gates;

C. Slash and timber barriers, pipe barriers, or a line of boulders across the right-of-way; and

D. Conifers or other appropriate trees or shrubs across the right-of-way.

VII. POST-CONSTRUCTION ACTIVITIES

A. MONITORING AND MAINTENANCE

1. Conduct follow-up inspections of all disturbed areas after the first and second growing seasons to determine the success of revegetation.

2. Revegetation in non-agricultural areas shall be considered successful if upon visual survey the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands. In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.

   Continue revegetation efforts until revegetation is successful.

3. Monitor and correct problems with drainage and irrigation systems resulting from pipeline construction in active agricultural areas until restoration is successful.

4. Restoration shall be considered successful if the right-of-way surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless requested otherwise by the land owner or land managing agency), revegetation is successful, and proper drainage has been restored.

5. Routine vegetation maintenance clearing shall not be done more frequently than every 3 years. However, to facilitate periodic corrosion and leak surveys, a corridor not exceeding 10 feet in width centered on the pipeline may be maintained annually in a herbaceous state. In no case shall routine vegetation maintenance clearing occur between April 15 and August 1 of any year.

6. Efforts to control unauthorized off-road vehicle use, in cooperation with the landowner, shall continue throughout the life of the project. Maintain signs, gates, and vehicle trails as necessary.

B. REPORTING

1. The project sponsor shall maintain records that identify by milepost:

   a. method of application, application rate, and type of fertilizer, pH modifying agent, seed, and mulch used;

   b. acreage treated;

   c. dates of backfilling and seeding;

   d. names of landowners requesting special seeding treatment and a description of the follow-up actions; and

   e. any problem areas and how they were addressed.

2. The project sponsor shall file with the Secretary quarterly activity reports documenting problems, including those identified by the landowner, and corrective actions taken for at least 2 years following construction.

WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES

01/17/2003 VERSION

WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES

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WETLAND AND WATERBODY CONSTRUCTION AND MITIGATION PROCEDURES (PROCEDURES)

I. APPLICABILITY

A. The intent of these Procedures is to assist applicants by identifying baseline mitigation measures for minimizing the extent and duration of project-related disturbance on wetlands and waterbodies. The project sponsors should specify in their applications for a FERC Certificate (Certificate) any individual measures in these Procedures they consider unnecessary, technically infeasible, or unsuitable due to local conditions and to fully describe any alternative measures they would use. Applicants should also explain how those alternative measures would achieve a comparable level of mitigation.

Once a project is certificated, further changes can be approved. Any such changes from the measures in these Procedures (or the applicant's approved procedures) will be approved by the Director of the Office of Energy Projects (Director), upon the applicant's written request, if the Director agrees that an alternative measure:

1. provides equal or better environmental protection;

2. is necessary because a portion of these Procedures is infeasible or unworkable based on project-specific conditions; or

3. is specifically required in writing by another Federal, state, or Native American land management agency for the portion of the project on its land or under its jurisdiction.

Any requirements in these Procedures to file material with the Secretary of the FERC (Secretary) do not apply to projects undertaken under the provisions of the blanket certificate program. This exemption does not apply to a request for alternative measures.

Project-related impacts on non-wetland areas are addressed in the staff's Upland Erosion Control, Revegetation, and Maintenance Plan (Plan).

B. DEFINITIONS

1. "Waterbody" includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes:

   a. "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing;

   b. "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and

   c. "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.

2. "Wetland" includes any area that is not in actively cultivated or rotated cropland and that satisfies the requirements of the current Federal methodology for identifying and delineating wetlands.

II. PRECONSTRUCTION FILING

A. The following information shall be filed with the Secretary prior to the beginning of construction:

1. the hydrostatic testing information specified in section VII.B.3. and a wetland delineation report as described in section VI.A.1., if applicable; and

2. a schedule identifying when trenching or blasting would occur within each waterbody greater than 10 feet wide, or within any designated coldwater fishery. The project sponsor shall revise the schedule as necessary to provide FERC staff at least 14 days advance notice. Changes within this last 14-day period must provide for at least 48 hours advance notice.

B. The following site-specific construction plans required by these Procedures must be filed with the Secretary for the review and written approval by the Director:

1. plans for extra work areas that would be closer than 50 feet from a waterbody or wetland;

2. plans for major waterbody crossings;

3. plans for the use of a construction right-of-way greater than 75 feet wide in wetlands; and

4. plans for horizontal directional drill (HDD) "crossings" of wetlands or waterbodies.

III. ENVIRONMENTAL INSPECTORS

A. At least one Environmental Inspector having knowledge of the wetland and waterbody conditions in the project area is required for each construction spread. The number and experience of Environmental Inspectors assigned to each construction spread should be appropriate for the length of the construction spread and the number/significance of resources affected.

B. The Environmental Inspector's responsibilities are outlined in the Upland Erosion Control, Revegetation, and Maintenance Plan (Plan).

IV. PRECONSTRUCTION PLANNING

A. A copy of the Stormwater Pollution Prevention Plan (SWPPP) prepared for compliance with the U.S. Environmental Protection Agency's (EPA) National Stormwater Program General Permit requirements must be available in the field on each construction spread. The SWPPP shall contain Spill Prevention and Response Procedures that meet the requirements of state and Federal agencies.

1. It shall be the responsibility of the project sponsor and its contractors to structure their operations in a manner that reduces the risk of spills or the accidental exposure of fuels or hazardous materials to waterbodies or wetlands. The project sponsor and its contractors must, at a minimum, ensure that:

a. all employees handling fuels and other hazardous materials are properly trained;

b. all equipment is in good operating order and inspected on a regular basis;

c. fuel trucks transporting fuel to on-site equipment travel only on approved access roads;

d. all equipment is parked overnight and/or fueled at least 100 feet from a waterbody or in an upland area at least 100 feet from a wetland boundary. These activities can occur closer only if the Environmental Inspector finds, in advance, no reasonable alternative and the project sponsor and its contractors have taken appropriate steps (including secondary containment structures) to prevent spills and provide for prompt cleanup in the event of a spill;

e. hazardous materials, including chemicals, fuels, and lubricating oils, are not stored within 100 feet of a wetland, waterbody, or designated municipal watershed area, unless the location is designated for such use by an appropriate governmental authority. This applies to storage of these materials and does not apply to normal operation or use of equipment in these areas; and

f. concrete coating activities are not performed within 100 feet of a wetland or waterbody boundary, unless the location is an existing industrial site designated for such use.

2. The project sponsor and its contractors must structure their operations in a manner that provides for the prompt and effective cleanup of spills of fuel and other hazardous materials. At a minimum, the project sponsor and its contractors must:

a. ensure that each construction crew (including cleanup crews) has on hand sufficient supplies of absorbent and barrier materials to allow the rapid containment and recovery of spilled materials and knows the procedure for reporting spills;

b. ensure that each construction crew has on hand sufficient tools and material to stop leaks;

c. know the contact names and telephone numbers for all local, state, and Federal agencies (including, if necessary, the U. S. Coast Guard and the National Response Center) that must be notified of a spill; and

d. follow the requirements of those agencies in cleaning up the spill, in excavating and disposing of soils or other materials contaminated by a spill, and in collecting and disposing of waste generated during spill cleanup.

B. AGENCY COORDINATION

The project sponsor must coordinate with the appropriate local, state, and Federal agencies as outlined in these Procedures and in the Certificate.

V. WATERBODY CROSSINGS

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply to the U.S. Army Corps of Engineers (COE), or its delegated agency, for the appropriate wetland and waterbody crossing permits.

2. Provide written notification to authorities responsible for potable surface water supply intakes located within 3 miles downstream of the crossing at least 1 week before beginning work in the waterbody, or as otherwise specified by that authority.

3. Apply for state-issued waterbody crossing permits and obtain individual or generic section 401 water quality certification or waiver.

4. Notify appropriate state authorities at least 48 hours before beginning trenching or blasting within the waterbody, or as specified in state permits.

B. INSTALLATION

1. Time Window for Construction

Unless expressly permitted or further restricted by the appropriate state agency in writing on a site-specific basis, instream work, except that required to install or remove equipment bridges, must occur during the following time windows:

a. coldwater fisheries - June 1 through September 30; and

b. coolwater and warmwater fisheries - June 1 through November 30.

2. Extra Work Areas

a. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from water’s edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.

b. The project sponsor shall file with the Secretary for review and written approval by the Director, a site-specific construction plan for each extra work area with a less than 50-foot setback from the water's edge, (except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land) and a site-specific explanation of the conditions that will not permit a 50-foot setback.

c. Limit clearing of vegetation between extra work areas and the edge of the waterbody to the certificated construction right-of-way.

d. Limit the size of extra work areas to the minimum needed to construct the waterbody crossing.

3. General Crossing Procedures

a. Comply with the COE, or its delegated agency, permit terms and conditions.

b. Construct crossings as close to perpendicular to the axis of the waterbody channel as engineering and routing conditions permit.

c. If the pipeline parallels a waterbody, attempt to maintain at least 15 feet of undisturbed vegetation between the waterbody (and any adjacent wetland) and the construction right-of-way.

d. Where waterbodies meander or have multiple channels, route the pipeline to minimize the number of waterbody crossings.

e. Maintain adequate flow rates to protect aquatic life, and prevent the interruption of existing downstream uses.

f. Waterbody buffers (extra work area setbacks, refueling restrictions, etc.) must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

4. Spoil Pile Placement and Control

a. All spoil from minor and intermediate waterbody crossings, and upland spoil from major waterbody crossings, must be placed in the construction right-of-way at least 10 feet from the water's edge or in additional extra work areas as described in section V.B.2.

b. Use sediment barriers to prevent the flow of spoil or heavily silt-laden water into any waterbody.

5. Equipment Bridges

a. Only clearing equipment and equipment necessary for installation of equipment bridges may cross waterbodies prior to bridge installation. Limit the number of such crossings of each waterbody to one per piece of clearing equipment.

b. Construct equipment bridges to maintain unrestricted flow and to prevent soil from entering the waterbody. Examples of such bridges include:

(1) equipment pads and culvert(s);
(2) equipment pads or railroad car bridges without culverts;
(3) clean rock fill and culvert(s); and
(4) flexi-float or portable bridges.

Additional options for equipment bridges may be utilized that achieve the performance objectives noted above. Do not use soil to construct or stabilize equipment bridges.

c. Design and maintain each equipment bridge to withstand and pass the highest flow expected to occur while the bridge is in place. Align culverts to prevent bank erosion or streambed scour. If necessary, install energy dissipating devices downstream of the culverts.

d. Design and maintain equipment bridges to prevent soil from entering the waterbody.

e. Remove equipment bridges as soon as possible after permanent seeding unless the COE, or its delegated agency, authorizes it as a permanent bridge.

f. If there will be more than 1 month between final cleanup and the beginning of permanent seeding and reasonable alternative access to the right-of-way is available, remove equipment bridges as soon as possible after final cleanup.

6. Dry-Ditch Crossing Methods

a. Unless approved otherwise by the appropriate state agency, install the pipeline using one of the dry-ditch methods outlined below for crossings of waterbodies up to 30 feet wide (at the water's edge at the time of construction) that are state-designated as either coldwater or significant coolwater or warmwater fisheries.

b. Dam and Pump

(1) The dam-and-pump method may be used without prior approval for crossings of waterbodies where pumps can adequately transfer streamflow volumes around the work area, and there are no concerns about sensitive species passage.

(2) Implementation of the dam-and-pump crossing method must meet the following performance criteria:

(i) use sufficient pumps, including on-site backup pumps, to maintain downstream flows;
(ii) construct dams with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner);
(iii) screen pump intakes;
(iv) prevent streambed scour at pump discharge; and
(v) monitor the dam and pumps to ensure proper operation throughout the waterbody crossing.

c. Flume Crossing

The flume crossing method requires implementation of the following steps:

(1) install flume pipe after blasting (if necessary), but before any trenching;

(2) use sand bag or sand bag and plastic sheeting diversion structure or equivalent to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required in to achieve an effective seal);

(3) properly align flume pipe(s) to prevent bank erosion and streambed scour;

(4) do not remove flume pipe during trenching, pipelaying, or backfilling activities, or initial streambed restoration efforts; and

(5) remove all flume pipes and dams that are not also part of the equipment bridge as soon as final cleanup of the stream bed and bank is complete.

d. Horizontal Directional Drill (HDD)

To the extent they were not provided as part of the pre-certification process, for each waterbody or wetland that would be crossed using the HDD method, provide a plan that includes:

(1) site-specific construction diagrams that show the location of mud pits, pipe assembly areas, and all areas to be disturbed or cleared for construction;

(2) a description of how an inadvertent release of drilling mud would be contained and cleaned up; and

(3) a contingency plan for crossing the waterbody or wetland in the event the directional drill is unsuccessful and how the abandoned drill hole would be sealed, if necessary.

7. Crossings of Minor Waterbodies

Where a dry-ditch crossing is not required, minor waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

a. except for blasting and other rock breaking measures, complete instream construction activities (including trenching, pipe installation, backfill, and restoration of the streambed contours) within 24 hours. Streambanks and unconsolidated streambeds may require additional restoration after this period;

b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and

c. equipment bridges are not required at minor waterbodies that do not have a state-designated fishery classification (e.g., agricultural or intermittent drainage ditches). However, if an equipment bridge is used it must be constructed as described in section V.B.5.

8. Crossings of Intermediate Waterbodies

Where a dry-ditch crossing is not required, intermediate waterbodies may be crossed using the open-cut crossing method, with the following restrictions:

a. complete instream construction activities (not including blasting and other rock breaking measures) within 48 hours, unless site-specific conditions make completion within 48 hours infeasible;

b. limit use of equipment operating in the waterbody to that needed to construct the crossing; and

c. all other construction equipment must cross on an equipment bridge as specified in section V.B.5.

9. Crossings of Major Waterbodies

Before construction, the project sponsor shall file with the Secretary for the review and written approval by the Director a detailed, site-specific construction plan and scaled drawings identifying all areas to be disturbed by construction for each major waterbody crossing (the scaled drawings are not required for any offshore portions of pipeline projects). This plan should be developed in consultation with the appropriate state and Federal agencies and should include extra work areas, spoil storage areas, sediment control structures, etc., as well as mitigation for navigational issues.

The Environmental Inspector may adjust the final placement of the erosion and sediment control structures in the field to maximize effectiveness.

10. Temporary Erosion and Sediment Control

Install sediment barriers (as defined in section IV.F.2.a. of the Plan) immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan; however, the following specific measures must be implemented at stream crossings:

a. install sediment barriers across the entire construction right-of-way at all waterbody crossings, where necessary to prevent the flow of sediments into the waterbody. In the travel lane, these may consist of removable sediment barriers or driveable berms. Removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent;

b. where waterbodies are adjacent to the construction right-of-way, install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way; and

c. use trench plugs at all waterbody crossings, as necessary, to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody.

11. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any waterbody. Remove the dewatering structures as soon as possible after the completion of dewatering activities.

C. RESTORATION

1. Use clean gravel or native cobbles for the upper 1 foot of trench backfill in all waterbodies that contain coldwater fisheries.

2. For open-cut crossings, stabilize waterbody banks and install temporary sediment barriers within 24 hours of completing instream construction activities. For dry-ditch crossings, complete streambed and bank stabilization before returning flow to the waterbody channel.

3. Return all waterbody banks to preconstruction contours or to a stable angle of repose as approved by the Environmental Inspector.

4. Application of riprap for bank stabilization must comply with COE, or its delegated agency, permit terms and conditions.

5. Unless otherwise specified by state permit, limit the use of riprap to areas where flow conditions preclude effective vegetative stabilization techniques such as seeding and erosion control fabric.

6. Revegetate disturbed riparian areas with conservation grasses and legumes or native plant species, preferably woody species.

7. Install a permanent slope breaker across the construction right-of-way at the base of slopes greater than 5 percent that are less than 50 feet from the waterbody, or as needed to prevent sediment transport into the waterbody. In addition, install sediment barriers as outlined in the Plan. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the waterbody.

8. Sections V.C.3. through V.C.6. above also apply to those perennial or intermittent streams not flowing at the time of construction.

D. POST-CONSTRUCTION MAINTENANCE

1. Limit vegetation maintenance adjacent to waterbodies to allow a riparian strip at least 25 feet wide, as measured from the waterbody's mean high water mark, to permanently revegetate with native plant species across the entire construction right-of-way. However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be maintained in a herbaceous state. In addition, trees that are located within 15 feet of the pipeline that are greater than 15 feet in height may be cut and removed from the permanent right-of-way.

2. Do not use herbicides or pesticides in or within 100 feet of a waterbody except as allowed by the appropriate land management or state agency.

VI. WETLAND CROSSINGS

A. GENERAL

1. The project sponsor shall conduct a wetland delineation using the current Federal methodology and file a wetland delineation report with the Secretary before construction. This report shall identify:

   a. by milepost all wetlands that would be affected;

   b. the National Wetlands Inventory (NWI) classification for each wetland;

   c. the crossing length of each wetland in feet; and

   d. the area of permanent and temporary disturbance that would occur in each wetland by NWI classification type.

   The requirements outlined in this section do not apply to wetlands in actively cultivated or rotated cropland. Standard upland protective measures, including workspace and topsoiling requirements, apply to these agricultural wetlands.

2. Route the pipeline to avoid wetland areas to the maximum extent possible. If a wetland cannot be avoided or crossed by following an existing right-of-way, route the new pipeline in a manner that minimizes disturbance to wetlands. Where looping an existing pipeline, overlap the existing pipeline right-of-way with the new construction right-of-way. In addition, locate the loop line no more than 25 feet away from the existing pipeline unless site-specific constraints would adversely affect the stability of the existing pipeline.

3. Limit the width of the construction right-of-way to 75 feet or less. Prior written approval of the Director is required where topographic conditions or soil limitations require that the construction right-of-way width within the boundaries of a federally delineated wetland be expanded beyond 75 feet. Early in the planning process the project sponsor is encouraged to identify site-specific areas where existing soils lack adequate unconfined compressive strength that would result in excessively wide ditches and/or difficult to contain spoil piles.

4. Wetland boundaries and buffers must be clearly marked in the field with signs and/or highly visible flagging until construction-related ground disturbing activities are complete.

5. Implement the measures of sections V. and VI. in the event a waterbody crossing is located within or adjacent to a wetland crossing. If all measures of sections V. and VI. cannot be met, the project sponsor must file with the Secretary a site-specific crossing plan for review and written approval by the Director before construction. This crossing plan shall address at a minimum:

   a. spoil control;

   b. equipment bridges;

   c. restoration of waterbody banks and wetland hydrology;

   d. timing of the waterbody crossing;

e. method of crossing; and

f. size and location of all extra work areas.

6. Do not locate aboveground facilities in any wetland, except where the location of such facilities outside of wetlands would prohibit compliance with U.S. Department of Transportation regulations.

B. INSTALLATION

1. Extra Work Areas and Access Roads

a. Locate all extra work areas (such as staging areas and additional spoil storage areas) at least 50 feet away from wetland boundaries, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land.

b. The project sponsor shall file with the Secretary for review and written approval by the Director, a site-specific construction plan for each extra work area with a less than 50-foot setback from wetland boundaries (except where adjacent upland consists of actively cultivated or rotated cropland or other disturbed land) and a site-specific explanation of the conditions that will not permit a 50-foot setback.

c. Limit clearing of vegetation between extra work areas and the edge of the wetland to the certificated construction right-of-way.

d. The construction right-of-way may be used for access when the wetland soil is firm enough to avoid rutting or the construction right-of-way has been appropriately stabilized to avoid rutting (e.g., with timber riprap, prefabricated equipment mats, or terra mats).

In wetlands that cannot be appropriately stabilized, all construction equipment other than that needed to install the wetland crossing shall use access roads located in upland areas. Where access roads in upland areas do not provide reasonable access, limit all other construction equipment to one pass through the wetland using the construction right-of-way.

e. The only access roads, other than the construction right-of-way, that can be used in wetlands without Director approval, are those existing roads that can be used with no modification and no impact on the wetland.

2. Crossing Procedures

a. Comply with COE, or its delegated agency, permit terms and conditions

b. Assemble the pipeline in an upland area unless the wetland is dry enough to adequately support skids and pipe.

c. Use "push-pull" or "float" techniques to place the pipe in the trench where water and other site conditions allow.

d. Minimize the length of time that topsoil is segregated and the trench is open.

e. Limit construction equipment operating in wetland areas to that needed to clear the construction right-of-way, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction right-of-way.

f. Cut vegetation just aboveground level, leaving existing root systems in place, and remove it from the wetland for disposal.

g. Limit pulling of tree stumps and grading activities to directly over the trenchline. Do not grade or remove stumps or root systems from the rest of the construction right-of-way in wetlands unless the Chief Inspector and Environmental Inspector determine that safety-related construction constraints require grading or the removal of tree stumps from under the working side of the construction right-of-way.

h. Segregate the top 1 foot of topsoil from the area disturbed by trenching, except in areas where standing water is present or soils are saturated or frozen. Immediately after backfilling is complete, restore the segregated topsoil to its original location.

i. Do not use rock, soil imported from outside the wetland, tree stumps, or brush riprap to support equipment on the construction right-of-way.

j. If standing water or saturated soils are present, or if construction equipment causes ruts or mixing of the topsoil and subsoil in wetlands, use low-ground-weight construction equipment, or operate normal equipment on timber riprap, prefabricated equipment mats, or terra mats.

k. Do not cut trees outside of the approved construction work area to obtain timber for riprap or equipment mats.

l. Attempt to use no more than two layers of timber riprap to support equipment on the construction right-of-way.

m. Remove all project-related material used to support equipment on the construction right-of-way upon completion of construction.

3. Temporary Sediment Control

Install sediment barriers (as defined in section IV.F.2.a. of the Plan) immediately after initial disturbance of the wetland or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench). Except as noted below in section VI.B.3.c., maintain sediment barriers until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Temporary erosion and sediment control measures are addressed in more detail in the Plan.

a. Install sediment barriers across the entire construction right-of-way at all wetland crossings where necessary to prevent sediment flow into the wetland. In the travel lane, these may consist of removable sediment barriers or driveable berms. Removable sediment barriers can be removed during the construction day, but must be re-installed after construction has stopped for the day and/or when heavy precipitation is imminent

b. Where wetlands are adjacent to the construction right-of-way and the right-of-way slopes toward the wetland, install sediment barriers along the edge of the construction right-of-way as necessary to prevent sediment flow into the wetland.

c. Install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way through wetlands. Remove these sediment barriers during right-of-way cleanup.

4. Trench Dewatering

Dewater the trench (either on or off the construction right-of-way) in a manner that does not cause erosion and does not result in heavily silt-laden water flowing into any wetland. Remove the dewatering structures as soon as possible after the completion of dewatering activities.

C. RESTORATION

1. Where the pipeline trench may drain a wetland, construct trench breakers and/or seal the trench bottom as necessary to maintain the original wetland hydrology.

2. For each wetland crossed, install a trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. Install a permanent slope breaker across the construction right-of-way at the base of a slopes greater than 5 percent where the base of the slope is less than 50 feet from the wetland, or as needed to prevent sediment transport into the wetland. In addition, install sediment barriers as outlined in the Plan. In some areas, with the approval of the Environmental Inspector, an earthen berm may be suitable as a sediment barrier adjacent to the wetland.

3. Do not use fertilizer, lime, or mulch unless required in writing by the appropriate land management or state agency.

4. Consult with the appropriate land management or state agency to develop a project-specific wetland restoration plan. The restoration plan should include measures for re-establishing herbaceous and/or woody species, controlling the invasion and spread of undesirable exotic species (e.g., purple loosestrife and phragmites), and monitoring the success of the revegetation and weed control efforts. Provide this plan to the FERC staff upon request.

5. Until a project-specific wetland restoration plan is developed and/or implemented, temporarily revegetate the construction right-of-way with annual ryegrass at a rate of 40 pounds/acre (unless standing water is present).

6. Ensure that all disturbed areas successfully revegetate with wetland herbaceous and/or woody plant species.

7. Remove temporary sediment barriers located at the boundary between wetland and adjacent upland areas after upland revegetation and stabilization of adjacent upland areas are judged to be successful as specified in section VII.A.5. of the Plan.

D. POST-CONSTRUCTION MAINTENANCE

1. Do not conduct vegetation maintenance over the full width of the permanent right-of-way in wetlands. However, to facilitate periodic pipeline corrosion/leak surveys, a corridor centered on the pipeline and up to 10 feet wide may be maintained in a herbaceous state. In addition, trees within 15 feet of the pipeline that are greater than 15 feet in height may be selectively cut and removed from the permanent right-of-way.

2. Do not use herbicides or pesticides in or within 100 feet of a wetland, except as allowed by the appropriate land management agency or state agency.

3. Monitor and record the success of wetland revegetation annually for the first 3 years after construction or until wetland revegetation is successful. At the end of 3 years after construction, file a report with the Secretary identifying the status of the wetland revegetation efforts. Include the percent cover achieved and problem areas (weed invasion issues, poor revegetation, etc.). Continue to file a report annually until wetland revegetation is successful.

4. Wetland revegetation shall be considered successful if the cover of herbaceous and/or woody species is at least 80 percent of the type, density, and distribution of the vegetation in adjacent wetland areas that were not disturbed by construction. If revegetation is not successful at the end of 3 years, develop and implement (in consultation with a professional wetland ecologist) a remedial revegetation plan to actively revegetate the wetland. Continue revegetation efforts until wetland revegetation is successful.

VII. HYDROSTATIC TESTING

A. NOTIFICATION PROCEDURES AND PERMITS

1. Apply for state-issued water withdrawal permits, as required.

2. Apply for National Pollutant Discharge Elimination System (NPDES) or state-issued discharge permits, as required.

3. Notify appropriate state agencies of intent to use specific sources at least 48 hours before testing activities unless they waive this requirement in writing.

B. GENERAL

1. Perform non-destructive testing of all pipeline section welds or hydrotest the pipeline sections, before installation under waterbodies or wetlands.

2. If pumps used for hydrostatic testing are within 100 feet of any waterbody or wetland, address the operation and refueling of these pumps in the project's Spill Prevention and Response Procedures.

3. The project sponsor shall file with the Secretary before construction a list identifying the location of all waterbodies proposed for use as a hydrostatic test water source or discharge location.

C. INTAKE SOURCE AND RATE

1. Screen the intake hose to prevent entrainment of fish.

2. Do not use state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate Federal, state, and/or local permitting agencies grant written permission.

3. Maintain adequate flow rates to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.

4. Locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable.

D. DISCHARGE LOCATION, METHOD, AND RATE

1. Regulate discharge rate, use energy dissipation device(s), and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive streamflow.

2. Do not discharge into state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate Federal, state, and local permitting agencies grant written permission.